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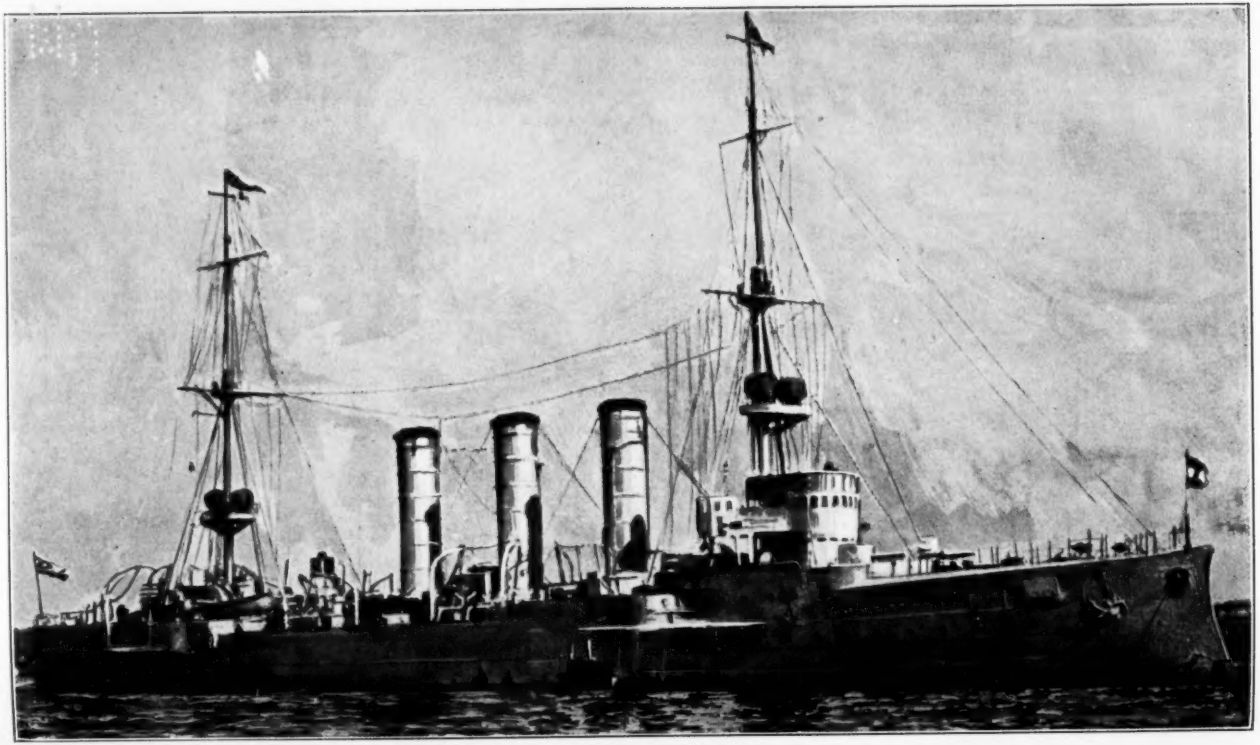

THE GERMAN CRUISER "EMDEN"

UNITED STATES NAVAL INSTITUTE PROCEEDINGS

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U. S. NAVAL INSTITUTE, ANNAPOLIS, MD.

Second Honorable Mention, 1916[1]

EDUCATION AT THE U. S. NAVAL ACADEMY

By LIEUTENANT RIDGELY HUNT, U. S. Navy

I

On one of the closing pages of the issues of the UNITED STATES NAVAL INSTITUTE PROCEEDINGS will be found the caption "Notice," and under it the words, "The U. S. Naval Institute was established in 1873, having for its object the advancement of professional and scientific knowledge in the navy." The sentence is a repetition of the second article of the constitution of the Institute adopted by the founders in 1873. Further on in the constitution is the provision that the papers read before the society and the discussion growing out of them shall be prepared for issue when a sufficient number shall have been accumulated to make a book of a specified size. Accordingly there was published in October, 1874, the first number of the first volume of the UNITED STATES NAVAL INSTITUTE PROCEEDINGS.

In this initial number the leading article, though it was not the first paper read before the society, was written by Captain (now Admiral) S. B. Luce. It bore the title "The Manning of Our Navy and Merchant Marine," and it contained an able exposition of the need of a training school for instructing and disciplining

[1] Permission to publish the article "Naval Personnel," by Lieut. Commander J. K. Taussig, U. S. Navy, First Honorable Mention, 1916, was refused by the Navy Department.

THE GERMAN CRUISER "EMDEN"

boys who were to become seamen. In the course of his remarks the author quoted the following:

> Education, it has been observed, has reference to the whole man, the body, the mind and the heart; its object, and, when rightly conducted, its effect, is to make him a complete creature after his kind. To his frame it gives vigor, activity and beauty; to his heart, *virtue*. If you would mark the perfect man, you must not look for him in the circus, the university, or the church exclusively, but you must look for one who has *mens sana in corpore sano*—a healthful mind in a healthful body. To make all men such is the object of education.

The purpose of this essay of mine is to make use of the above quotation as a text for a dissertation on the subject of education; but with this difference, that in the remarks about to be hereinunder submitted for consideration, the intention is to make them applicable exclusively not to him in the circus—though some clowns may be referred to; nor in the university—though some wise men may be spoken of; nor in the church—though some clergymen may be mentioned; but to him in the naval profession. And, here again, not to every man in that profession—though some officers may be brought into view; but solely to that comparatively small number of young men at Annapolis who, under the title of midshipmen, constitute the Naval Academy, a governmental institution consecrated to the duty of teaching the youth there gathered together the underlying principles of the naval profession, and of inspiring them with the belief that they will in time become complete creatures after their kind and bear the mark of the perfect man, of him of a healthful mind in a healthful body. To insure such results so far as is humanly possible, is the particular aim and object of the education a midshipman is given while he is at the Naval Academy.

It is to be hoped no reader will imagine that the education a midshipman may receive while under watch and ward at Annapolis will be so beneficial, so sensible and so full, as to comprise everything he will need to acquire to make him a complete creature. No such assertion is made and no such averment intended. From the very nature of things—the youth's age, inexperience, environment, the course of instruction, the constraints of discipline, such a finality of undergraduate progress is clearly impossible. The fact is that at the Academy a midshipman is but a growing sapling, a young tree fresh from the nursery taking root in a new soil and gradually becoming acclimated in a wonderful garden not at all

of the common variety like that to which he has been accustomed, but one wherein the twig will be uncommonly bent so as to insure an exceptional inclination of the tree.

The bending process, the compulsory acquirement of the essentials of the naval profession, may be different as regards the methods employed at Annapolis from those in use at other colleges where the demands of discipline may be less exacting. But in them all, civil and military, the controlling motive is the same, to bring a child up in the way he should go, trusting that when he enters upon manhood he shall be adequately prepared to face his duties courageously and acquit himself honorably. Hence the reason for the interest so many people take in college activities, and the discussions, criticisms and suggestions of the alumni and other persons, of the manner in which the colleges perform the functions assigned to them by society. In like manner and for like reasons officers of the navy ought to take thought of the methods of their alma mater and make bold to express their opinions of the manner in which she administers the trust confided to her.

That no college performs its work to the satisfaction of patrons is a common idea voiced by the complaining query heard on all sides, "What is the matter with our colleges?" The men who submit answers usually restrict the remedies suggested to the cure of the ills of a particular institution. Rarely are the changes recommended for advancing the welfare of one college in harmony with those advised for another; and not infrequently the alterations in the modes and manners prayed for by one set of men of a college are opposed by another set of men of the same college notwithstanding that both sets have equally at heart the good of their alma mater.

Quite like men of other professions and other colleges, naval officers put the similar question, "What is the matter with the Naval Academy?" And proceed to answer it much after the manner of college growlers of divergent views and various opinions; but with less insistence on the points which agitate the tempers of civilian alumni. For Naval Academy graduates have in mind what other graduates have not, two specific grievances—maybe three—exclusively their own, beside which other baneful effects and needs of reform pale their "uneffectual fire" and fade into comparative insignificance. Indeed some officers honestly be-

lieve that the troubles complained of at Annapolis would entirely disappear were these two or three obstacles, as they see them in the path of progress and development, removed. But as to what should be substituted in order to make the road clearer there is no unanimity of sentiment.

II

What is the matter with Annapolis? One answer, a very general one, but one containing the essence of nearly every complaint lodged against the school, was written by the head of a department and member of the academic board, in 1912:

> Notwithstanding the fact that the methods of teaching used here are good, and that the midshipmen probably use more of the four years at the Naval Academy to advantage, on an average, than is used in other schools, criticism of the Academy and its graduates is creeping in—from the fleet and from other sources. A straw vote taken here would show that the majority of the instructors and heads of departments think that in preparing them for their life work we are not giving the midshipmen the best course we could give them.[2]

This is severe but not startling or novel. It had often been said before and has often been repeated since, and probably its telling began with the founding of the school 70 years ago. To trace it so far back, however, is not necessary, since a starting point may be taken in 1879 when the Naval Institute published the prize essays on naval education.

Naval education was the subject of the first essays ever submitted in competition for a prize. It was set by the Institute; and the order of rank of the competitors was determined by a committee of three judges—Dr. Eliot, president of Harvard University, Rear Admiral Daniel Ammen of the navy and Chief Engineer Shock of the navy, none of them Annapolis men or connected with it. The award was: First prize, Lieut. Commander Allan D. Brown; second, Lieut. Commander C. F. Goodrich; and third, Commander A. T. Mahan—all of these officers were graduates of the Academy, and were on duty there at or about that time.

From that day in 1879 to this day in 1915, 36 years, no essay on the subject of naval education has not only not won a prize, but so far as can be gathered from turning over the pages of the 160 numbers of the UNITED STATES NAVAL INSTITUTE PROCEEDINGS issued to date, there is no internal evidence, excepting perhaps a paper on

[2] U. S. Naval Institute Proceedings, March, 1912.

alma mater published in September, 1908, that an essay on that important subject has ever been submitted in competition. This assertion does not mean that naval education has not been written about at all; for as a matter of fact short articles have appeared now and then, written generally by some officer attached to the Academy; but even so, these attempts at setting forth what may be the matter with Annapolis, together with accompanying suggestions of remedial measures, have not been so noticed or discussed by officers as to produce the impression that the naval service at large takes a sincere and lasting interest in the work Annapolis is doing.

For a moment, however, let a return be made for a hurried glance at what the three noted essayists had to offer for modifying and changing an organization and a system of long standing which, they argued, were harmful and gradually undermining efficiency and *esprit de corps*. The measures recommended as desirable for invigorating the service and promoting its welfare were summed up by the winner of the first prize, Lieut. Commander Brown, as follows: "I assume the broad principle that (with the exception of the medical officer and chaplain) *every* officer on board ship should be a combatant sea officer, a graduate of the Naval Academy, an efficient addition to the strength of the ship's company, in lieu of the present plan by which many of the ship's complement are unskilled and untrained in the use of arms." This broad principle was endorsed by the competing essayists and by the members of the Institute in attendance at the hearing. Twenty years later it was partly adopted by amalgamating the line and engineer corps, and warranting machinists. With some of the other measures recommended, fortune has been kind though tardy; for instance, to-day there is a postgraduate school, midshipmen are commissioned as ensigns on graduating, and marine officers or staff officers may be appointed from Academy graduates. But not in 1879, when the propaganda was first published, any more than there had been in preceding years, was there harmony at all points; and these distant notes of discord echo through the corridors of time as vibrant as when first struck.

One of the long heard strains which agitated the minds of some officers and caused unrest, was the method in force of nominating candidates for appointment as midshipmen. Since to nominate a candidate is an inalienable right appertaining to each individual

congressman, it would seem to be but a beating of the air to complain of the manner in which he exercises that privilege. Whether a boy reach Annapolis by the road of competition, or selection, or favoritism or nepotism, ought to be of as little concern to the Academy as who are his parents or what is his religion. Such matters fall not properly within the purview of naval officers; hence they should be dismissed from the mind as of no consequence.

Another note of discord which has vexed the ears of navy men ever since the founding of Annapolis, is the fixing by Congress of the limits of the age of the boys who shall be admitted into the Academy. In this matter as in the preceding, interference is an attempt to intrench on the prerogatives of Congress; for that body itself, after duly considering the pros and cons, has set the age limits; and it unquestionably has the authority so to do. Furthermore, it cannot be maintained that Congress has acted unwisely; it has taken thought of the development of education in the country at large—about which it knows more than navy men; and of the demands of the naval profession—about which it keeps itself informed through the Navy Department; and it has moved accordingly. In earliest years candidates for admission to the school were 14 to 16 years of age. Gradually these limits were raised until the year 1904 when they were set at 16-20 years, and they so remain to this day. Further change may come, if so it will be because of reason and not because of haphazard opinion.

The reason for the present law of entrance age has been given by Medical Inspector Ames of the navy, who, after a long tour of duty at Annapolis, wrote:

> I think it would be a great mistake (to reduce the age of entrance from 16-20 to 15-17). It is known so far as psychology is concerned, that in the youth of fifteen the mind is not developed, and it follows of course, if you are going to take them at fifteen, unless you can select out of a great many the number required, you are going to fail, because it is apparent that it is preparing and not advancing the mind, as the intellectual centers are not developed until 17 or 18 years of age. This is now recognized in all institutions of learning, and instead of reducing the age, I think it would be better to keep it as it is, I would say 17 to 20. . . . . I think it would be a great mistake from the intellectual side, to reduce the age here.[3]

In view of the above professional opinion, it would seem to be advisable, especially so since naval officers are of two or three

[3] Quoted in U. S. Naval Proceedings, Sept., 1908, "Alma Mater."

minds concerning the desirable age of eligibility of candidates, and moreover since the navy is not responsible for fixing the age of admission whereas Congress is, that the disturbing thought that natal limitation is at all related to what is wrong with Annapolis be banished. Also that further agitation of the question be foresworn until throughout the length and breadth of the land the public schools stand on the same educational level, and the intellectual and moral endowments of the pupils are the same always as the same age. Manifestly this can never be; therefore to continue harping on the subject may be likened to fiddling while Rome is burning.

A third cacophonous strain of Naval Academy education sounded many years ago and reverberating as intensely and loudly to-day as ever, rehearses the disputations concerning the amount of time which should be expended by midshipmen in acquiring their education in the grove of Academe. As far in the past as the year 1851, six years after the opening of the school, the academic board suggested the advisability of adopting a scheme of instruction which would insure a consecutive course of studies of four years on shore before commencing actual sea service. The proposal was accepted; the four years course was set; and it has been held to ever since, despite repeated efforts to have it changed. Prayers and supplications, arguments and entreaties, bursts of anger and wails of woe, have all alike proved inefficacious. The millstone hung 65 years ago about the neck of alma mater still is pendant, the incubus to her progression still remains, the four years are still there, and no prospect of relief is in sight.

No one of any imagination will deny that in a four and a half years' course, or a five years' course, or a six years' course, more book learning can be acquired than in a four years' course. But can it be proved that the additional knowledge to be obtained from a prolonged study of text-books will so benefit the student that, as a consequence, he will be better prepared to take up the manifold duties of active service? No. The prolongation of academical instruction would tend to retard and not advance the subsequent expansion of the faculties of him who will have to familiarize himself, not only with the military side of his profession, about which he will have had some preliminary training, but also with the civil side, that of society, about which he will have had no

enlightenment whatever. Therefore his further retention in the circumscribed atmosphere of the Academy for the sole purpose of imparting additional theoretical naval instruction, is a suggestion which under the circumstances cannot be applauded.

From the worldly point of view undergraduate education is merely elementary and theoretical and inconclusive and impractical. "The average college man cannot," in the graphic words of Stanley, the explorer, "understand business, cannot build or make anything, cannot command men; only after long and laborious practice can he be entrusted to do rightly any of these things." Annapolis men, like other college men, may be called upon at any time to do rightly any and all of these things—to trade, to build, to command; and the intent of the Academy education is to prepare midshipmen to commence—but only to commence—this long and laborious practice with energy and determination. Will lengthening the time of preparation beyond the four-year limit assure greater subsequent efficiency than is possessed by the average collegian? Hardly; if the prevailing opinion of the educational world be accepted as a criterion.

Perhaps, however, as strong a reason as any other for ceasing to dwell on the advisability of altering the course at Annapolis from four years to three years or six years or any other than what it is, is that Congress here, too, has fixed the time. It has become second nature with some people to find fault with the transactions of Congress, to believe that it is always playing politics, is heedless and unmindful of important national affairs, and is singularly ignorant and neglectful of naval matters. Whether such views as a whole be justifiable or not, Congress is a responsible body and is accountable to the country for its acts. And although some of its members may be stupid and uninformed and vote carelessly and unwisely, yet on every committee, and notably on the navy committee, sit several men, some of them college bred, capable, intelligent, with a good knowledge of educational matters, who take a more sincere interest in Naval Academy affairs than some persons are disposed to admit; and who endeavor in the light of experience and information to advance the interests of Annapolis for the benefit of the service.

To yield a cheerful and ungrudging obedience to the laws these legislators have prescribed for the government of the Academy, would seem to be a concomitant of a situation not strange or un-

common, not unsuspected or improvised, but regular and old and habitual and traditional; well understood and thoroughly comprehended by all hands, and in full accord with the approved custom of other colleges throughout the country. Hence the suggestion is ventured that the practice of graduating midshipmen in four years should not be selected to bear the brunt of the adverse criticism which is creeping in from the fleet, and from other sources, that midshipmen are not given the best course that could be given them.

The remarks relating to the propriety of accepting uncomplainingly the laws of Congress, must not be construed to mean that the faculty of the Academy should sit silent and inactive while objectionable measures were about to be passed. Quite the contrary is intended. Annapolis should enter protest and endeavor to have its own plans adopted, provided they are based on a concensus of naval opinion as to what is wrong and what should be done to right the wrong. And the entire body of alumni should join hands with the protestants in furthering the prayer for plans for improving conditions at the school. But at the present time there are no evidences apparent of solidarity of naval sentiment. Now and then a voice is heard crying distractedly in the wilderness that midshipmen are not given the best course that could be given them; but those who have ears to hear will not hear. Therefore it befits Annapolis to accept cheerfully and determinedly existing conditions; to improve each shining hour of the four years; to make the utmost of the very considerable resources of the school; and to inspire every instructor to greet his great and solemn duty as the preceptor of young men who are to be taught to serve their country, with a cheery, "Ay, Ay, Sir!" The finest expression, wrote Admiral Goodrich, ever invented for the acknowledgment of an order.

Then what *is* the matter with Annapolis? The answer will be come to by and by.

III

Seventy years ago the United States Naval School—as the Academy was then called—was established at Annapolis by George Bancroft, Secretary of the Navy, for the following specifically stated purposes: First, to give greater concentration to the services of the excellent professors who had been teaching at various

naval stations. And secondly, to guard the morals of the young midshipmen who were exposed while on shore to numerous temptations. In full recognition of these principles of incorporation, Commander Franklin Buchanan, the first superintendent, when he opened the doors of the school on October 10, 1845, on ground where Bancroft Hall now stands as a memorial to the founder, addressed the incoming midshipmen as follows: "By carefully avoiding the first step toward intemperance, shunning the society of the dissolute and idle, and by cherishing the wish to deserve and the hope of receiving the approbation of your country, you can alone render yourselves able to occupy with honor the high standing in the navy to which many of you are destined." Other matters were touched on in the inaugural, but none so emphatically as the adjuration to suppress those tendencies and inclinations to misbehavior supposed to be inherent in our forefathers of 70 years ago, wild youngsters aged from 15 to 27 years, who, upon leaving duties afloat to take up studies ashore, were disposed to be a trifle insubordinate and dissipated. Therefore was the moral side of life called to particular notice rather than the mental and physical, though these were provided for in the curriculum—mathematics, astronomy, the theory of morals, law, "the use of steam, the Spanish and the French languages," and the teaching of fencing and infantry drill.

Commander Buchanan's earnest admonition against wine, women and song went by the board long ago, unheeded because unneeded. For, although in earliest times the young sea dogs may perhaps have been inclined to be a bit wild, yet were they not really vicious or unlike other youngsters of their day. They were amenable to discipline, grew apace in grace and discretion, and in due time occupied with honor "the high standing in the navy." Their successors have not proved to be better men or better officers and certainly not better seamen. Since those days, however, so carefully have the first steps towards intemperance come to be avoided, that now the entire navy drinks not the gin or our ancestors, but the ginger of our prohibitionists, and midshipmen prefer the taste of the springs of knowledge to that of the fire-water for which the ancient mariners had such reprehensible fondness. Nevertheless when recalling the days of the navy that are no more, some tears must rise in the heart and gather to the eyes for the gallant gentlemen of the old school, the rum old commodores

of song and story who were never so knocked about by the bullets and the gout as to be unfit for sea and for upholding the honor of the flag.

These officers and gentlemen of other times learned the lesson of the sea on board sailing ships and learned it well. But the advent of steam and its applicability to naval requirements concentrated attention at Annapolis on the urgency of substituting for methods fast becoming obsolete and inefficient, a wisely devised scheme of naval instruction to be worked out by competent instructors on shore under modern conditions. Therefore, with unity of purpose and a keen perception of the exigencies of the navy present and prospective, the instructors at the Academy, civilian and military, formulated a plan and put it in operation in 1851, only six years after the establishment of the school. How well these pioneers builded is evidenced by the fact that the controlling features of the system adopted 65 years ago are in essentials those to be seen at Annapolis to-day—the four years' consecutive course of study, practice cruises, division of time, a marking scale of four, and other less noteworthy details. Also at about this time the age of entrance of candidates was fixed, and the mode of appointing them.

Immediately following the announcement of the above program, there arose from many briny throats hoarse cries of denunciation, forecasts of failure, and general condemnation of the school. The age of entrance was wrong—boys of 14 should be sent to sea first, to school afterwards. The method of appointing midshipmen was objectionable—it should be by selection, or competition, or some other way. The course of four years' study was absurdly long—it should be for two years or three years; and the subjects taught should be strictly nautical. This censorious attitude of the early critics of the school is of no moment except as an illustration of the mental similarity with other critics who have been expressing their disapproval from that time to this.

It is assumed by the carpers that at Annapolis midshipmen are not given the best course that could be given them. But apparently the best course is indeterminable; such a surmise is warranted by the opinions a few officers have printed in recent years in the UNITED STATES NAVAL INSTITUTE PROCEEDINGS. Some of the writers advocate the teaching of more electricity; some, more mechanics; some, more ordnance; and so on, than at present. Too

much theory say some, too much practice say others. In no instance is there agreement. Equally conflicting is the advice as to the steps to be taken to make the conjectural course the best—where to subtract from, where to add to, the subjects now being taught, or what to omit and what to take on, in the Utopian curriculum. It is all very disconcerting, and confusing, and perplexing to the conservative mind of the ordinary man. And what way out of the muddle do the controversialists offer? The impracticable one of prolonging the four years' course by one year, or one and a half years, or two years, according to individual fancy. Here again is confusion worse confounded by the arguments of those who would amend the established order by imposing on Annapolis that theory or that practice for which each advocate has a predilection. Such a variety of preachments cannot convince, cannot convert men; and, what is straight to the point, cannot change the statutory limit of time. Therefore, what is demanded of Annapolis is, that she shall give to her students of a fixed age during a fixed course at the Academy the best education possible.

IV

It is of the utmost importance, in endeavoring to determine what is the matter with the Naval Academy, to ascertain the right point of view from which things should be looked at and judged of and then to keep to that point, for the mass of events can only be apprehended in their entirety from one standpoint, if inconsistency is to be guarded against. This point of view is, as stated above, the recognition that appointees, their ages and the four years' course of study are thoroughly well known and firmly fixed elements in the cosmogony of Annapolis. These incontrovertible truths having been permanently grasped, a consideration of the question Naval Academy education may now be undertaken.

An inquiry into the aims of the education of the Academy requires at the outset a consideration of, first, the material with which the school will have to begin; and secondly, what it is that Annapolis wishes to make of this material. Midshipmen are the nominees of members of Congress and may be said to be fair representatives of the several grades of society in the various parts of the country and in that way to embrace a greater range of character and of social antecedents than can be found in the leading

colleges.[4] In some instances recruits to the training stations and recruits to the Naval Academy appear to come from the same people—all are the products of a century and a half influence of republican institutions on our race.[5] (The recent law admitting 15 apprentices annually transfers the appearance into the reality.)

Obviously this human material with which the Academy has to begin its work is compounded of divers and sundry youths gathered from the great cities and the wide plains; from the palaces of the rich and the cottages of the poor; from the homes of distinguished parents and the camps of hewers of wood. Some of it is good material, some indifferent, and some bad. But to all the young men who compose it, whencesoever they come, whatsoever their ability and whosoever their sponsors, the arms of alma mater are opened equally wide; and, having enfolded them, she subjects them one and all to the same ordeal, weighs every one of them in the same balance, and judges each one of them by the same standards. There follows a ruthless winnowing of the unfit from the fit, a casting out of the lame, the blind and the halt, and, as a consequence, the retention of only the strong and able—a homogeneous body, a satisfactory material to be worked into shape, like clay in the hands of the potter. And what is it that Annapolis wishes to make of this refined material? It wishes to fashion from it officers for the navy, men of healthy minds in healthy bodies who, in the many parts they will have to play in life as business men, makers and builders, and commanders, will be inspired to be worthy and true by the *esprit de corps,* the devotion to duty, and the honor and patriotism worked into their very souls by the education of the Naval Academy.

What is this education that can potentially, when rightly conducted, give to a man's frame vigor, activity and beauty and to his heart virtue? It is defined in the Century dictionary as follows: "The imparting or acquisition of knowledge; mental and moral training; cultivation of the mind, feelings and manners. Education in a broad sense, with reference to man, comprehends all that disciplines and enlightens the understanding, corrects the temper, cultivates the taste and forms the manners and habits; in a narrower sense, it is the special course pursued, as by parents and teachers, to secure any one or all of these ends."

[4] Luce. [5] Mahan.

Both broadly and narrowly the Naval Academy is committed to the task of education as it is set forth in the words of the Century definition. Therefore, for the furtherance of these ends, men, means and measures are amply provided so that the work may be diligently pursued with the earnest desire to satisfy the intention of Annapolis training and instruction, the great object of which is, said the late Superintendent, Rear Admiral C. R. P. Rodgers, "not so much to make midshipmen or young lieutenants, but to make officers to command the ships of our navy and to make the navy strong and able for the work all navies must do henceforth."

"The three M's are all that we need—morals, mind and muscles. These must be cultivated if we wish to be immortal." So wrote Henry M. Stanley, of African fame, about young men who aspired to do things—without, of course, having the Academy in mind. Stanley gained his wish: and it is noteworthy that he placed morals first in the order of importance in his triad of needs, declaring specifically that "there was danger in paying attention to mind and muscles only."

The late Admiral Mahan who, like Stanley, sought and won immortality, though in a different field and in a different way, placed the order of needs of those men who aspired to become worthy naval officers, as follows: Moral power, physical ability and intellectual attainments. "Let me try to state clearly," he wrote in his honorable mention essay in 1879, "what qualities you should especially wish in the line officers of the navy. I scarcely think I can err in assigning to the foremost place moral power"; which he describes as "strength to control self and others; promptitude in action; readiness of resource; calmness amid excitement."

A third distinguished man who has won world recognition of his ability, the famous head master of Rugby School, Dr. Thomas Arnold, said: "What we must look for here (Rugby School) is first, religious and moral principles; secondly, gentlemanly conduct; thirdly, intellectual ability." "You should feel," he told his boys, "like officers in the army or navy whose want of moral courage would indeed be thought cowardice." Here not only are morals placed first in the order of essentials of honorable manhood, but they are emphasized as being of the very essence of the character of a naval officer.

The three remarkable men whose words have been quoted, differed from one another in personality, kind, experience and in what they aspired to do, and did do, as widely as was possible. Excepting that each one so cultivated the three M's as to win immortality there were few points of contact among them, scarcely any of sympathy, none of method. Stanley and Mahan were contemporaries, Arnold preceded them, he died when they were born. Stanley from a waif and adventurer became a daring explorer and discoverer; and won a knighthood. Mahan brought up at West Point and trained at Annapolis, became a captain in the navy and the eminent expounder of sea power, and won honors from native and foreign universities. Arnold, an Oxford graduate and Church of England priest, became head master of Rugby School and won fame from the manner in which he conducted that institution, and as a scholar and educator.

What meaning do these renowned men, so unlike to one another in what they achieved, intend to convey to the mind of the hearer when they use the word *moral* to express their conviction that it is the indispensable requisite in the shaping of character? Admiral Mahan explained it as innate power over self and others and over events, and correct judgment and behavior. A shorter and more comprehensive definition is, "of or pertaining to rules of right conduct" in which the connoting word is *right*.

Right as adjective, adverb, noun and verb is given about 30 definitions in the Century dictionary, and a large number of them may be applied to a description of the quality of the rules of conduct which should regulate the behavior of men. For example, right means "in conformity with moral law." Also, "obedience to or harmony with the rules of morality; moral rightness." Also, "to have a moral obligation; be under a moral necessity." And in many other definitions occur such words as *truth, justice, reason, duty*.

For present purposes the definition selected from out the many, is this one, "Right conduct; a just and good act or course of action; anything which justly may or should be done." And as an illustration of its applicability to the rules of right conduct, the following quotation: "With firmness in the right as God gives us to see the right." Plainly Mr. Lincoln inferred that what was right was moral, and that what was moral was of the essence of Christian ethics, which is really but the science of morals. A science, by

the way, taught for 20 years at the Naval Academy and held in such high esteem as to have a department of ethics and English with a full professor at its head.

To see the right is not always a simple thing to do; for circumstances are not absolute, not fixed by unchangeable laws, not controlled by immutable surroundings. Rather is the right subjected to the effects these unstable conditions of time, place and surroundings produce in the mind of him who is under their influences, consciously or unconsciously, and who while thereinunder is called upon to act firmly in conformity with moral principles. Even the ten commandments so good a Christian gentleman as Dr. Lyman Abbott tells us "are not 10 statutes which must be carefully studied and literally construed. They are concrete illustrations of general principles in accordance with which one should regulate his conduct and will regulate his conduct provided the right spirit dwells within him." Here again the difficulty of always seeing the right confronts one.

The following hypothetical question has been put:

> A is a good boy. B is a bad boy. When A and B are together B breaks a window notwithstanding A's remonstrance. The teacher finds the broken window and suspects that A knows about it. Should A tell? And should the teacher bring pressure on A to make him tell?[6]

Substitute for window in the above question, the word regulation or rule, but not the word law—that word comes under a different category to be referred to later—and a case of frequent occurrence at Annapolis and at other colleges, indeed in all life, will be presented for argument and discussion. Suppose, however, that as a concrete example, a not dissimilar situation to the broken window, and one that has now and then in times past confronted the authorities at the Academy, be offered for analysis and adjudication.

Once at the dead hour of night a bowling alley ball was rolled along the upper corridor of the New Building (I mind me of a time that's gone) and another and another. They make a thunderous noise. Hark! Did ye not hear it? The gong sounds, doors slam, orders are shouted. There is a hurrying and a scurrying to and fro and a hastening down the stairs. In the lower corridor the battalion is formed and mustered; and the blue line of collarless

[6] The Atlantic Monthly, April, 1914.

midshipmen stands motionless at attention. A death-like silence reigns. Then, livid with rage, appears the officer in charge. "Who rolled those balls?" No answer. "I order those men to step forward." No movement. "If they do not do so the battalion will be kept standing all night." No one stirs. "I place the battalion upon its honor to compel the men who rolled the balls to step to the front." The dazed line wavers; it grows uneasy; there is a little whispering in ranks; some turning of heads; some hesitancy of action. Then, under pressure, the two or three guilty ones announce themselves. The battalion is dismissed. The men go back to bed wondering sleepily what is the good of it all. And the play is played out.

One or two similar happenings may be referred to. For instance, the report by an officer off duty that he had seen some midshipmen drop over the wall and slip away undetected. Another, the dropping of a bucket of water at midnight on Shovel Nose, the sneaking, whispering watchman whose delight was to catch and report midshipmen. In these instances as in the first one cited, the battalion was turned out, formed and put upon its honor. *Fiat justicia ruat coelum.*

Shovel Nose's proper name was Morgan. The sobriquet was derived from his nose having no septum. Because of this he could not speak above a whisper. He was a short, stout, ugly, red-faced, red-bearded and red-headed man. He would and did report every infraction of the regulations he saw, and his blue eyes were very keen. His good quality was frankness; he openly said he would report and no cajolery could deter him. Watchmen were supposed to watch buildings; instead they watched midshipmen. Midshipmen thought this "pretty low down." Some of them, now old men, remain of that opinion. To be under such surveillance was degrading. It ought never to have been tolerated. Its moral effect was distinctly bad.

To resume. Did the action of the officers in charge in the above cases meet in a satisfactory and conclusive manner, the challenge to discipline implied by the unusual and improper behavior of the midshipmen who rolled the balls, frenched, dropped the bucket, or who committed other similar high crimes and misdemeanors? The answer to the A and B problem will suffice. It is this: "There is, of course, no answer. It would depend on A's, on B's, on the teacher's personality, on innumerable circumstances of time

and place and other persons, on antecedents and on probable consequences. How can you have a fixed answer to meet all contingencies? Men are not machines. My correspondent," wrote H. Fielding Hall, the propounder of the question, "supposed there was an answer that was always true; he was in search of the absolute."[1]

No reflection on the disciplinary methods at present in force at Annapolis is intended in what has just been told. Neither is consideration now invited of the nature and unseemliness of the pranks of midshipmen; nor yet of the midshipmen themselves, their cussedness and wickedness. Instead the intention is to allude to the officer in charge, past, present and to come, his moral qualities, his power to control self and others and events, as these tend to affect the ethics of the undergraduate world of the Naval Academy.

Your essayist is of an age to have children old enough to be midshipmen and he believes he still has a mind sufficiently acute and active to discern, measurably perhaps, the inferences to be drawn from incidents of the past and of the present. He, therefore, ventures the suggestion that the above-mentioned course of procedure of the officers in charge for maintaining discipline, was unwise and inept; and perhaps, when one considers the plight of the helpless battalion, not right. Is he wholly mistaken in thinking that the officers abused their privilege and power, and that their management was not in strictest conformity with ideal moral concepts? This question bears no relation to the fair and square detection of misdemeanors whatever may be their nature; it refers to specific cases only and their specific treatment.

The thought just expressed that sometimes men in power fail to recognize their obligations to subordinates, first came into mind in midshipman days. Then, as now, was denied the right of an officer or any other person for that matter, to place a man without his free, uncoerced assent thereto, upon his honor. That a midshipman is a gentleman, a man of truth, having scrupulous regard to rectitude, must be assumed as an indisputable fact. Only after irrefragable evidence of dishonest or dishonorable conduct can this assumption be cast aside. Till then his honesty must not be ques-

[1] Mr. H. Fielding Hall is a retired British proconsul who has spent a quarter of a century in important administrative positions in Burma. Some of his experiences have been published in the Atlantic Monthly.

tioned and his honor, his own most sacred possession, must never be impugned.

What is this sacred thing, this honor? According to Wordsworth, it is:

> The finest sense
> Of justice which the human mind can frame,
> Intent each lurking frailty to disclaim,
> And guard the way of life from all offense
> Suffered or done.[8]

There is honor among thieves, in essence the same as among gentlemen, though it may seem to be perverted. Indeed, honor binds every man to live up to the spirit of its code whether he be a thief or an officer or even a midshipman. It is possible, however, that a youth's imaginary and untested standard of ideal, honorable conduct may be lowered and not raised by treating him, not as if he were a human being with a conscience and an inbred sense of what is high minded, sensitive to insult and regardful of contumely, but as if he were a machine incapable of thought and feeling, and ability to see the right—with no virtue at all in his heart.

Such a view point of midshipmen is to be deprecated. It not only is pitiless, unsympathetic, unmoral, a denial of just rights, but it is dangerous and might lead an officer into an error of judgment that would eventuate in blemishing an inherently refined character which he is morally bound to guard and to develop into a perfect man with virtue in his heart, and not as might happen, into a young Ishmael; an exaggerated way, no doubt, of seeking to account for the sentiments of a young ensign who some years ago wrote "to a very great many, the great reason for the unpleasant remembrances they have of the Academy is the feeling of resentment to injustice, and until the cause is removed the feeling is bound to remain."[9] The cause in all cases is the antogonism, whether real or imaginary makes no difference, existing between officer and midshipman. Why?

This is not an agreeable subject to inquire into deeply in search of an answer; for if it be done with persistence, it may expose to the light those motives of the human heart which are seldom permitted to be seen and which even to the man himself are not only obscure, but generally so unknown as to be unbelievable and

[8] Quoted by Professor Theo. D. Woolsey in "Political Science."
[9] Quoted in "Alma Mater" Proceedings, Sept., 1908.

therefore to call forth an indignant denial. None the less the probable deduction to be drawn by a careful searcher of psychological data will be that subconsciously officers sometimes oppress midshipmen because midshipmen being stupid, unsophisticated, troublesome young creatures, addicted to vexatious ways that are dark and tricks that are vain, it is the easiest thing in the world to do. It always has been so in all navies. From time immemorial midshipmen have been "cuffed and cussed" and have had to bear the brunt of the displeasure of superior officers whether merited or not. That midshipmen of to-day are older than of yore, wiser, more independent, steadier, better men in nearly every respect than their prototypes, has not materially altered their status as insignificant members of the body naval to be harried at the pleasure of dyspeptic and perchance despotic seniors. Such is their lot, a tradition inherited from the ages, a custom more honored in the observance than in the breach. It satisfies the innate spirit of mortal to be proud and to exercise unshackled that joy of authority which is symptomatic of megalomania. Fathers of families are not exempt from it, especially at breakfast time. But in these instances there is what there is not at Annapolis, affection between father and son, which makes all the difference in the world.

"How do you like midshipmen?" was once asked an officer on duty at the Academy. "I'd like to eat one every morning for breakfast," replied as honest, good natured and thoroughly capable an officer and gentleman as ever lived. One of sympathy, too, and affection. Furthermore, he at heart really liked midshipmen—as young men, not as a breakfast cereal—but he bullied them, spotted them, vented his ill-humor upon them, all because it could be done so easily. Every officer did it; it was in the air, the *costumbre del pais*. To explain that the precedent was bad, the atmosphere unwholesome, the custom harmful; that his conduct showed lack of moral force and might lead youngsters into thinking that it was the duty of oldsters to be relentless, hard, pitiless, would have greatly surprised, shocked and pained him. Not, however, because the exposition showed the conditions supposedly existing; for these he maintained were non-existent, creations of a distorted imagination, and not worth contradicting; but because such a point of view betrayed a ridiculous conception of the underlying motives of officers at Annapolis whose only incentives were their moral obligations to educate midshipmen to be perfect men of their

kind; a duty which they discharged with faithfulness and tenacity of purpose.

The propriety of either supposition, like or dislike of midshipmen, need not be stressed, since each man will decide the question in accordance with his recollections of the days of labor and nights devoid of ease he passed at the Academy under the rules of officers, some of whom once detested, he has since found to be delightful gentlemen, and some of whom he has since found still retain their capacity to make life somewhat burdensome. That the young victim of circumstances at Annapolis may, when removed therefrom, forget the disagreeable episodes of his four years and recall only the good things that came out of Nazareth, is devoutly to be wished. Furthermore, it is well for the service that this forgetfulness should go hand in hand with the passing of time and the absorption of mind in moving events; otherwise the discontent engendered by remembered wrongs, real or fancied, might cripple the efficiency of the fleet. However, oblivion does not invariably signify that the effects of academic treatment have left no scars to mark the not perfect man; else how account for the fault-finding, unhappy officer, him of shattered ideals, of lost ambition, of hopes laid waste?

V

A story which can be vouched for as substantially true, runs somewhat as follows: Long ago a midshipman appealed in person to the Secretary of the Navy to have his examination papers in shipbuilding re-marked, on the ground that below 2.5 had been given on purpose to bilge him. The Secretary at first refused to entertain the suggestion, stating that prejudice could not sway the judgment of honorable officers, men incapable of malicious persecution as charged. "Am I to take your word against their word?" the Secretary asked, "Yes, sir, you are," again and again insisted the boy—remember he was fighting for his life—and he begged and pleaded that other officers, he cared not who they might be, should mark his papers, and he would abide uncomplainingly by their decision. The papers were sent to Washington, two former instructors in shipbuilding marked them, and the youngster was graduated.

The above, unadorned tale points a moral in whichever of several lights it be looked at. First, if the department had refused to recognize the rights of the petitioner, he would undoubt-

edly have been bilged—in fact he had been—and in all probability no one would have been a jot the wiser except the original markers of the paper, who perhaps might have chortled in their glee at having attained their desires; and the young man would have gone home, recounted his experience and not been believed. There would have been no disturbance of the composure of the Academy. But, on the other hand, the midshipmen may all along have been cognizant of the situation—the wish of Annapolis to get rid of the boy; for young men are often aware of what their superiors contemplate, and may have entered a silent protest in condemnation of a system which permitted such a travesty of justice to pass unnoticed. Thus the shipbuilding department would have been brought to the bar of undergraduate judgment for censure; also the academic board for not restraining the shipbuilding department; and finally the Navy Department for not overruling the academic board. And hence the faith of the midshipmen in the rectitude of the government, a belief that ought to be bred in their bones, might have been rudely shaken.

Again, the Navy Department upon restoring the young man to good standing, might have detached the recalcitrant officers, they surely were not deserving of considerate treatment. But such procedure might have had the effect of exposing all superiors at Annapolis to the derision or the contempt of the midshipmen, since young men cannot wisely discriminate between what is fair and what is unfair or what is accidental and what is intentional, and it might have stimulated exalted ideas of undergraduate power, unwarranted by the facts, which might have encouraged the midshipmen to fancy that in the event of trouble befalling them, the Navy Department would not only stand by the sufferers, but would espouse their side rather than that of the officers, a pernicious and dangerous state of mind.

Again, the Secretary might have returned the papers to the Academy with instructions to the officers to raise the boy's mark; all this without giving the matter any unnecessary publicity, though both officers and midshipmen could not help but know it. What would have been the moral effect on the officers? On the midshipmen?

Again, the shipbuilding department, maintaining stoutly it had done its duty impartially and properly, might have refused to raise the mark to 2.5, to recede at all from its first position—it undoubt-

edly had the moral right to take this stand, what then? In any and every solution that may be offered, there is one fixed factor to be borne in mind, the moral one. That is to say, what would have been a better course to pursue to give to the hearts of midshipmen more virtue and to their minds more health than the course which was followed by the Secretary of the Navy?

There swims into ken in a further glance at the above case, the broad, ethical question of the right of interference by the Navy Department in strictly Naval Academy affairs. Of course no one will deny that literally speaking Washington holds the right, meaning the authority of law to impose its mandates on Annapolis, but does not interposition as a rule affect injuriously the morale of the institution as a whole—its officers and its midshipmen, its character and its education? Even in the specific case just cited the intrusion of the Secretary of the Navy for the express purpose of nullifying academic action at the mere dictum of a bilged midshipmen—for the boy's word was all the evidence the Department had on which to base its interference—would seem to have been *prima facie* altogether unseemly. That a miscarriage of justice would have followed a refusal to revise the decision of Annapolis is plain enough. But the predicament was an exceptional one, it could not be foreseen or guarded against by either Annapolis or Washington, none other like it has ever been heard of and is not likely to be. Hence the opinion is ventured that by and large the Naval Academy could do better work in a more contented spirit were officers confident that their single-mindedness in furthering the good of the service would not be mistrusted, than is probable when good faith and honorable intention are called in question under misapprehension of the true state of affairs.

The resulting gain to Naval Academy education which would follow the adoption by the Navy Department of a policy of hands off, would greatly enhance the self-respect of the institution and bring about an atmosphere of serenity and completeness. Unfortunately, however, an undercurrent of opposition, not dissimilar to that running between midshipmen and officers, runs between Washington and Annapolis, its source derivable from the inability of the one to appreciate at its worth the point of view of the other. The one sees with the civilian eye, the other with the military eye, hence the same thing may appear different to the two eyes. The

responsibility, however, of the Secretary of the Navy is much heavier than that of the Superintendent of the Academy and the faculty; for the Secretary controls the Superintendent and through him the academic establishment. Presumably this overlordship is never wantonly exercised to obstruct academic advancement, but is brought into play only when a doubt arises that Annapolis action may not prove to be conclusive. In order to remove any such uncertainty from the Secretary's mind, officers of the Academy have on occasion gone to Washington and urged somewhat too vehemently, may be, the advisability, even the necessity, of compliance with Academy decrees. Such energy is all very well in a way and creditable, but may be pushed to such an extreme as to provoke opposition and suggest interested motives—personal, perhaps, rather than professional.

Once in June week some first classmen were caught drinking whiskey and, as a consequence, were sentenced to dismissal. Fearing the Secretary of the Navy might commute the sentence, some of the higher officers of the Academy hastened to Washington to represent the heinousness of the crime and the baneful impression a condonement of the offence would produce, not only on the minds of midshipmen, but on the officers and the whole system of academic discipline. But the Secretary demurred and was supported by the avowal of many friends of the guilty that they themselves had unthinkingly in celebration of the strife of four years at college being o'er, the battle won, been "a little in drink," but that absolutely no consequences could be deduced therefrom. So in lieu of expulsion the topers were sent on the practice cruise, and graduated afterwards.

The gist of this incident and also of others like it, more or less familiar to all officers, is that the excessive zeal of the Annapolis officers to secure the approval of their decisions by the Secretary aroused in him, a civilian, and in other non-military men as well, the suspicion that midshipmen were dealt with so harshly and drastically as to retard rather than advance the moral purposes to be served by disciplinary measures, an opinion in which doubtless the general public shares. "The quality of mercy is not strained."

On the other hand the unrest that might follow a frequent and promiscuous exercise of the quality of mercy should constrain the Secretary to be chary of wielding his power; and always the benefit

of the doubt should go to the Academy. It may be affirmed that officers, striving earnestly to elevate the tone of Annapolis, feel keenly a disparagement of their efforts. Enthusiasm is dashed, duty becomes a bore, and an inclination to be harsh and cross is stirred; peace of mind is upset, resentment creeps in, the moral tone is affected. The even tenor of the little community, shut in from the rude world by high walls, where peace and happiness are so necessary for successful administration, is much disturbed. Finally, whatever inauspicious direction the action of Washington may cause the mind and temper of Annapolis to take, the disaffection will spread and react upon the midshipmen, since they in the last analysis are the contributary cause. Thus everywhere will come inquietude and vexation of spirit. Ill-humor breeds discontent and this in turn irritation. And nothing in this world is easier, as said before, than to take it out on midshipmen. "Great fleas have little fleas upon their backs to bite 'em."

Then what do? Strive with might and main to find the way out, and even though it be the hardest, be satisfied. The way suggested is this: Take into kindly consideration the offender and the time, place and circumstances of the offence, and endeavor dispassionately to make the punishment fit the criminal and the crime, bearing in mind the fact, that midshipmen are not machines, that the absolute is unattainable in human affairs, that there are at least two sides to every question, and that the Naval Academy is more than an aggregation of officers and young men. If the Secretary of the Navy, because of the nature of the offence committed and the penalty imposed, be the court of last resort, send him the brief and accept complacently and with good humor the decision, perhaps even be glad that an order for lenity accompany it. What say the men who went on the practice cruise as a punishment for their jollity?

Here enters into account a notable point. Suppose the Secretary receive a note from the President asking that if possible the wishes of Senator X, to have the sentence of dismissal of his protegé revoked, be complied with? There is nothing improbable in this; the commander-in-chief has been appealed to; he answers as he thinks proper. Neither Secretary nor Academy has the right to complain or to criticize, although both may know that some one has blundered.

VI

The effect produced on the character of midshipmen as young men, that is, on their moral ideals and on their sensitiveness rather than on their mentality, by the overriding by Washington of Annapolis needs careful consideration. To appreciate what it may be one must endeavor to turn time backward in its flight and to become once again a midshipman in thought, word and deed. How difficult is this reversion from the mental habit of meeting the adult responsibilities of society to the far distant ideas and ideals of youth unaware of these obligations, can be attested by fathers of sons and more impressively by teachers of young men in school and college where the spirit of youth sets the pace and largely controls the morals of the brotherhood. The situation to be envisaged is this:

> School and college are not mere tiny subdivisions of society. They have no relation to the natural universe. They are separate worlds, as artificially administered as any laboratory. Outside the barriers of youth we are accustomed to base the laws we make on public opinion; within them the community is compelled to accept an alien code, but its opinion remains its own and the two are in sharp contrast. Nor does public opinion within school or college bear any relation to opinion in the world at large.[10]

Some of the articles of the alien code the undergraduate body of Annapolis is compelled to accept were brought to public attention outside the barriers by the investigating boards that last summer inquired into the iniquity of midshipmen. These searchers after truth laid bare what has long been known to men interested in college morals, namely: that the opinion of midshipmen, as of other collegians, of what is right, of what is permissible and of what is wrong in their own tiny subdivision of society, is at variance with the opinion of the world at large in respect of approving moral concepts which, society in general maintains, lack substance for their justification. Very true no doubt. But the disagreement between those outside the barriers and those within ought not to cause astonishment among the outsiders, and lead to a hasty condemnation of the Naval Academy, its pupils, its instructors, and its endeavors to shape the perfect man. And it ought not to excite people to throw up their hands, put ashes on their heads and wail all is lost even honor. No more is this true of the Naval Academy

[10] Atlantic Monthly, January, 1914. The Editor.

than of Yale or Harvard or any other college. All the officers of the American Navy have grown into manhood with healthy minds and healthy bodies, under a similar code of ethics, artificially administered and in sharp contrast with the laws of society based on public opinion.

When officers were midshipmen physical ability was reckoned higher than mental ability, the strong body than the strong mind. In athletics every trick of the trade fair and unfair was resorted to with approval. Great enthusiasm was demanded for all sports whether as participant or spectator and whether enjoyable or not. Some subjects of study had to be liked, others disliked; some instructors encouraged, some snubbed—midshipmen know how to do this; some practical exercises had to be entered into with spirit, others with listlessness; and so on. All persons and all things were judged by the critical standards set up by the midshipmen themselves. Where to draw the line between what a midshipman might do and what he might not do in the community of midshipmen was, and of course still is, understood only by themselves. It is not only not known to the layman beyond the pale, but is inexplicable. A midshipman may examine surreptitiously an instructor's marking book. He may gouge if he be a low-stand man, but not if he stand high—at times the code has permitted gouging by all hands, at other times it has prohibited all gouging. He may steal an examination paper without the express sanction of the code, and to make use of the information so obtained without compunction is legitimate, but to report the fraud and the thief is wrong. And hazing has always been practiced.

With some of these undergraduate customs no full-grown man can sympathize. The world over they are condemned as bad, dishonorable, immoral; not to be condoned on any ground, not to be excused by any sophistry. Neither youth, nor inexperience, nor ignorance can serve their turn. That they may have been acquiesced in in the midshipmen days of officers who now fiercely attack them is regrettable, but does not in the least militate against their discontinuance. Indeed, the excuses that once seemed to justify such wayward faults and passions of youth, are distressing to remember. Root and branch they should be cut down and cast into the fire. *Delenda est Carthago.*

Suppose a midshipman be caught red-handed at some devil's work and be sentenced to expulsion. Will the execution of the sentence

without hesitation or delay—either of which might tend to obscure the issue and its obloquy—deter others, if time and opportunity offer, from repeating the offence? May be it will, since the influence of a vicious man over his fellows is often very harmful, and his removal and the dread of the consequences of continuing the practices, might produce a change of heart in the brotherhood. On the other hand, may be it will not, since the guilty one may be held by his classmates as a man of no account and his detection might be ascribed to stupidity of which a clever man would not have been guilty; hence the moral effect of his removal would be *nil*. In either case, however, the final impression made on the moral attitude of the midshipmen as regards the discreditable act of one of their number, will depend on their own point of view and not on that of the officers; and their ideas and opinions will be colored by the popularity the offender enjoyed and by their apprehension of the propriety of the efforts of the officers to secure his dismissal, and very little by the inference to be drawn from the disgrace rightly pertaining to a forced and ignominious withdrawal from the Academy.

A dean of Harvard College once expressed himself somewhat to the following effect: That one of the first lessons in college life is an axiom—crime is crime, and a thief is a thief, even in an institution of learning. The college thief, has, it is true, a different motive from his less favored brother; but is the motive better?[11] The midshipman who gouges at examination, or uses stolen papers, or goes on sick list to shirk, "may be clever and funny to read about, but his cleverness and funniness are not many degrees removed from those of the forger and imposter who may also be amusing in fiction."[11] The discouraging thing is that a midshipman should do it at all. That he did what everybody does and has been doing at the Academy in conformity with the code for years and years, bows down with shame the heads of the alumni who in old age can see the danger of fooling with the standard of truth.

To cause an immature mind to move in a desired direction when it is confident of its own rectitude and its ability to regulate affairs better than an outsider can, is as difficult a task as can fall to the lot of an instructor of youth; and is susceptible of full accomplishment only by the exercise of great tact, circumspection and pa-

[11] LeBaron Briggs, "The Mistakes of College Life."

tience, in such manner as will lead the unsophisticated young man into the conceit that the wished-for change of heart shall be his own doing, the result of his own thinking and of his own ideas of what constitutes moral conduct, uninfluenced in any degree by the quiet coaching of his mentor and the appeal to his better nature, and by the imperceptible pressure of public opinion.

The practice of hazing may be offered as an illustration of this condition of set purpose and of resistance to extraneous influences of the undergraduate character—of the difficulty of giving to his heart virtue. Hazing is regarded by midshipmen as a legitimate and worthy means of initiating fourth classmen into the mysteries of a society in which every new member must be forcibly restrained from displaying any tendency towards being independent, in manner and movement, of the control of the older members, and must admit himself to be "the meanest worm that crawls the earth." Be this as it may, the peculiar and unusual features to be noticed in regard to hazing are: First, that a midshipman to matriculate at Annapolis must take the solemn oath of allegiance—in essence to support and defend the laws of the United States. And secondly, that one of these laws specifically prohibits hazing and provides the punishment for infringement—dismissal, and in severe cases, dismissal and imprisonment for one year.

Under these positive inhibitions it seems extraordinary that violating the laws of the land which bear on the practice of hazing, should have become such a fixed habit as to be unbreakable by any of the measures so far resorted to. A quick discovery of the guilty ones and immediate sentence and dismissal have sometimes —not always—stopped for the time the third class from continuing to haze the fourth class. But the immune fourth classmen have, upon becoming third classmen, joyfully embraced the custom in defiance of possible consequences. Indeed, all midshipmen, and perhaps a few officers, believe not only that hazing does no actual harm to person or institution, but that it really is beneficial in that it quickly brings a plebe to his proper bearings as no other way can.

This view, however, is both absurd and irrelevant and is contrary to fact and to law. Contrary to fact in that hazing having been abolished in many colleges, a distinctly better state of morals and a happier undergraduate life have resulted. Contrary to law in that it breaks the letter and the spirit of the statutes of the nation midshipmen are bound to safeguard.

Since severe punitive measures have failed of effect, other methods less drastic and more in the nature of an appeal to reason and good nature might be tried, the essence of the course to be the dissipation of the idea that hazing is manly, officer-like, conducive to *esprit de corps,* and that on the contrary it is unlawful, ungentlemanly, cowardly. By kindly hints, soft words gently spoken, and the power of suggestion, officers of the Academy may be able temporarily to mitigate the evil, as has just happened by the apparently voluntary determination of the upper classmen to abolish the practice. But to eradicate it, the navy, the whole navy, must take the matter to heart and bring the full force of its influence to bear. Public opinion has already suppressed hazing in the better colleges, the authorities can seldom do so. What public opinion can do for the colleges, naval opinion can do for Annapolis; and it is the bounden duty of all officers, an obligation second to none in their profession, to see to it that the moral standard of the Academy is at least on the same level as that of the better colleges. It is only by the pressure of the universal sentiment of the service that midshipmen can be made to feel and know that the good name of Annapolis is committed to them, and not to their officers, and especially to the upper classmen, "and is in a manner their property. They are responsible for the character which is given to it by themselves." [12]

There needs no ghost come from the grave to affirm the fact that the moral qualities of midshipmen at the Academy derive their value largely from the *noblesse oblige* ideas which are evolved from the consciences of the upper classmen. If these arbiters forbid hazing, or gouging, or theft or any other wrong practice, not only will the third class give o'er the play, but all the other classes as well. First, however, there must be assurance that the property, the good name of the Academy these upper classmen are to guard, shall be held as a sacred trust, inviolate; and this dependence must derive certitude from the ascendency of noble obligations which must permeate the Academy through the influence exerted by these young men, and which must be kept alive by the subtle persuasion of instructors who realize that they have the greatest of all fields in which to work and the most curious subject for thought and inquiry—human nature.

[12] Benjamin Jowett, Master of Balliol College.

Human nature at Annapolis is quite like human nature elsewhere. A midshipman like other American youth, is impatient of strict discipline and is always more easily and successfully led than driven; which is in his favor and in that of the wise teacher, for the latter is well aware that it is far more profitable to lead than it is to push and press forward the unwilling. A midshipman is critical of his instructors. He judges them as he judges his own comrades, and he accords his respect and his attention or withholds them in accordance with the outcome of his comparisons. He is perfectly willing to do anything for the man who takes the trouble to study him and to treat him as a human being; he is ready to follow, but he will not easily be constrained. He will rigidly enforce discipline if the enforcement be left to him; he will probably kick over the traces if the man in authority holds the reins too tight. . . . . He is a youth, not an old head on young shoulders, but a real youth with all the charm of his age and with all the essential traits of it. . . . . He believes in himself, in his country, yet he is ready to take advice."[13]

The above description of the American collegian—applied specifically here to the American midshipman—is paraphrased from the remarks of a foreigner. It presents a kindly and true appreciation of the characteristics of American naval officers when they were midshipmen and youth had its full, fair swing. Its correctness must be borne in mind when endeavoring to estimate fairly the youngsters' point of view as it differs from that of the oldsters.

VII

Although, as has been said in preceding pages, the occasional intervention of the Navy Department in Academy affairs may not have been followed by harmful consequences, still it may come to pass that persistent intermeddling by Washington with the quiet, earnest endeavor of Annapolis to encourage the worship of lofty ideals and to elevate, purify and direct the character of midshipmen, to instill virtue in their hearts, may have a deleterious effect. The subject is again called to attention because of recent happenings at Annapolis and is further expanded, more particularly with regard to the personality of the midshipmen. Reform of objectionable tendencies in moral ideas may be delayed, even frustrated,

[13] Americans and The Britons," by Frederick C. de Sumichrast.

if Washington interpose objections to the expulsion of a midshipman whose conduct has been wicked, perhaps criminal, since such leniency can have no other issue than to embolden other men to attempt similar deeds, relying for exculpation, not on the Academy powers, whose rules have been impudently set at naught under the impression that officers have mistaken ideas of what is right, but on the clemency of the Navy Department.

By pardoning and absolving wrong-doers, the distinction between right and wrong will become obscured in the untutored minds and consciences of youth who labor under the delusion that they are competent to govern themselves and correctly solve moral problems; their point of view becomes distorted. Therefore, in seeking a guide for their way, they will quite naturally follow the line of least resistance which will, without their intending it or becoming aware of it, lead to trouble, perhaps to disaster. For example, there appeared last summer the information that a few midshipmen with burglar's kits were in the habit of robbing instructors' desks of copies of examination papers and distributing the questions to the students. Thus was the regiment forewarned and forearmed. Not a member revealed the theft, though nearly every member in his conscience must have suspected it and some members must have known the thieves; and scarcely a member refused to become a receiver of stolen goods, though their origin must have been known or suspected by everyone.

For how long a time the nefarious practices, very bluntly stated above, may have been carried on is immaterial to the larger question now to be considered of the effect produced on the character and the moral qualities of Naval Academy education—its means, its men and its measures—by the pressure of alien hands. What is very much to the point is the knowledge that in the past some wrong acts have been condoned, some punishments mitigated, some expelled midshipmen restored to good standing, by means of influences extraneous to the Academy and in opposition to its wishes, its rules and regulations, and its laws; and that the resultant of these outside forces has been so extraordinary and so far reaching as to encourage a member of the United States House of Representatives to say (so the newspapers reported) in defence or in excuse of the conduct of a midshipman charged with committing unlawful acts, that "The Naval Academy is rotten from top to bottom."

Such words, if they ever were uttered, smack of hysteria, an old definition of which was, "A nervous disease characterized by unrestrained desire to attract attention and sympathy." If the congressman's unrestrained desire was to attract attention to himself and his client, to the midshipmen and the Academy, the officers, the system and the administration, he attained it. For the remark was widely quoted in the newspapers, and Annapolis affairs were brought prominently to the attention of the public. But that an equal amount of sympathy for his client as the victim of corrupt practices was also attracted by his *ipse dixit* of rottenness at Annapolis, was not at all obvious.

Were it in any sense true that the Naval Academy is rotten from top to bottom then the question of what's the matter with Annapolis would be definitely answered. But it is not true, it cannot be true. Some things at the school might perhaps have been better done than they were done, some officers there may have been temperamentally unsuited for academic duty, some carelessness of administration may have crept in, some mistakes of discipline and organization may have been made—the man who never made mistakes never made anything—and there may have been some errors of judgment, some blunders, some failure to grasp with full intelligence the significance of signs and portents. But that these shortcomings incident to human kind singly or in mass, had the effect of making the Naval Academy rotten from top to bottom—putrid, corrupt, decayed, foul, is as impossible of belief as that the moon is made of green cheese, and equally absurd. The whole history of the Academy, its past, its present, even in its temporary eclipse, proclaim the injustice and the unkindness of the cut.

VIII

The consequences of the terrible swearing of the army in Flanders were not glaringly obvious, no battles were won, no enemy routed, the oaths were merely mouthings. So may it be with the wholesale condemnation of the system of Naval Academy education, in operation to-day as in substance it has been for the past 70 years, but which now, however, for some reason not clear, ought to be made, so it has been asserted, to give way to some other order not explained and perhaps not explainable. What is this system, old and established, which the destructive criticism of

iconoclasts would overthrow? It is a plan of education, mental, moral and physical, for cultivating the healthy mind in the healthy body under military rules and regulations, with a view to indoctrinating midshipmen in the traditions of the American Navy, to insuring obedience and submission to higher authorities, to inspiring patriotism and love of country, and while doing so to impart a rudimentary knowledge, theoretical and practical, of naval science. The scheme is worked in the open before the eyes of him who cares to look. There is nothing mysterious or sinister about it. And only in respect of the manner in which the authorities operate the system by exerting a control which is practically absolute over the movements of the students, does it differ materially from the systems in practice in every vocational school. The Naval Academy is a college of discipline, whereas the other, the civil school, is a school of freedom. The fundamental difference between them has been thus explained: "In the college of discipline, the tendency is to emphasize the duty to society, as represented by the organization, at the expense of the individual; in the college of freedom the tendency is to emphasize the rights of the individual at the expense of the social organization." [14]

No attempt will be made to controvert the statement that in the college of discipline the tendency is to emphasize the duty to society as represented by the organization. It is a patent fact. Men of the navy believe in the navy, hope for it, pray for it, and feel that above all other duties their duty to it and not to themselves or to society, is paramount. Such ideas may not be profound, since they take not into consideration, except incidentally, the standards of society as well as those of the organization—together a multiplicity too large for midshipmen or even older men to grasp understandingly. Besides, there are rooted in a military organization, principles of discipline and moral doctrines altogether at variance with those of the man in the street and society in general in America, and which develop in the individual who adheres to them an aristocratic disposition and not a democratic one, as would exclusive devotion to the tenets of the social order. It may be added that likewise, even in normal times, there are nations in which society is so enamored of the doctrine of power that a

[14] Quoted from Dr. Pritchett by Admiral Goodrich in Proceedings, September, 1909.

military caste is permitted to exercise a controlling influence in social activities and thought, just as there are other states where such ascendency is not known at all. These contrary ideas in shaping the social fabric are perfectly expressed on the one hand in Germany where *Verboten* stares one in the face at every turn and the air is charged with militarism—respect for and obedience to authority vested in a military uniform. And on the other hand in France where the sign that faces one on church front, legislative hall and even military barracks, is *Liberté, Egalité, Fraternité,* denoting fully the Frenchman's conception of the life of freedom, although in France as in Germany there is, even in times of peace, universal conscription—every man must be a soldier.

Indeed, it may be said that every military organization, whether it be supported and upheld as a component of the social organization, or be restricted to its own exclusive, narrow limits by the people, is proud, ambitious, aristocratic, and in thought, habit and cult devotedly egotistical. It believes that its springs of action, the spirit and sentiment of its organization, its *esprit de corps,* are more estimable and worthy and noble, than similar qualities which actuate society at large. And it is obsessed by the idea that when war comes—as it has come in many lands—the people will gladly turn over the safekeeping of the social organization to the care and protection of the military organization, and that the aristocracy of the sword will be acclaimed.

Here in the United States, as also in England, there is under normal conditions of peace neither conscription nor military enthusiasm. In England, however, the profession of arms is held in higher esteem than here because many officers are by inheritance aristocrats. But American society, democratic and without the aristocratic traditions of England, pays scant courtesy to the military profession, holding it in less esteem perhaps than other professions like those of the circus, the university or the church. This need cause no wonderment, for the essence of a military force is undemocratic, its whole basis is a hierarchy with the power centering in one head. Its only democratic feature, all the world over, is that its ranks are open to men of every class and caste—if such terminology be permissible in speaking of American society. But this democratic origin of an army and navy sinks into oblivion with the swearing of fealty to the colors. Then and thereafter one man ceases to be the equal of another or as good as another.

Barriers are raised between the rank and file, and marked distinctions separate officers of one grade from those of another.

This subjection of one man to another in a military organization implies submission to the will of the man higher up, belief in his greater sagacity, confession of his right to command and to be obeyed. He is a superior and must be thought so, deference must be paid him, and homage, and respect, and loyalty. Here then is an aristocracy as definite and well marked as if it were hereditary. It is an order possessed of prescriptive rank and rights in its own organization. It has its own codes of honor and morals. And it has its own doctrine, our country right or wrong, which it reveres as the faith to uplift it through life unto death with a beatific satisfaction known only to martyrs. *Dulce et decorum est pro patria mori.*

IX

Into this veritable *corps d'élite* midshipmen are initiated upon entering Annapolis. Never before have they seen anything so foreign to their preconceived notion of democratic institutions. They are strangers in a strange land and are reluctant, not unnaturally, to surrender the privileges of a birthright of equality in favor of the doctrines of an organization in which the knee must be bent in pagan-like adoration of a uniform worn by they know not whom. This fundamental and imperative elimination of personality and yielding of will to men in authority, the third classmen have heretofore essayed to instill by hazing, a method clearly indicating their own limited discernment of the situation; the second classmen have cooperated less forcibly, and the first classmen have approved the practice. That this system is defective and wrong in several moral respects the midshipmen themselves have recently admitted by abolishing hazing. Henceforth, therefore, the tone of the classes may be expected to improve rapidly, the sound mind in the sound body to grow apace, virtue to creep into the heart, and the young men tend towards becoming officers and gentlemen.

In order to qualify for membership in the naval aristocracy a man must be an officer and a gentlemen. To become the first he must be educated by officers and gentlemen; for this purpose Annapolis exists. To become the second no instruction, properly speaking, ought to be needed, the presumption being that he is already instinct with the concepts of genteel behavior and moral

conventional conduct. Donning the uniform of the organization merely adds to the responsibilities of good breeding those of the sacred duties of officer. Said the founder of the American Navy, John Paul Jones, "None other than a gentleman as well as a seaman both in theory and practice is qualified to support the character of a commissioned officer in the navy."

What does this word gentleman, which in the navy cannot be dissociated from the word officer, connote?

"The gentleman, it has been said, is a man who is never offensive unintentionally," said the Parson. Two of the guests murmured "intentionally," by way of correction. "No," he said, "a gentleman is sometimes offensive when honor and reason demand it, but then he means to be. The man who is not a gentleman is often offensive when he does *not* mean to be." But is he always a gentleman when he is intentionally offensive? "The gentleman is . . . . I have heard a gentleman say a thing without discourtesy which was repeated after him, word for word, by another member of the party and it became discourteous at once. It isn't what the gentleman says or does, it is something behind—intention, attitude, manner, method."

The gentleman "must be set on making the best of life as it is, at every moment of the day; he must be always aware of the drift of other people's thoughts and moods, and he must never set his own mood against their's. In fact, I believe it is a blend of sympathy and self-possession. . . . The point of the whole thing is that no gentleman ever thinks whether he is or is not one." [15]

But midshipmen think whether the officer is or is not one. They have their ideals; and if in intention, attitude, manner, method he fail to measure up to their standard they brand him as "no gentleman." And from that moment his influence for good declines. There have been in times past officers at Annapolis who were discourteous, rude, rough, when honor and reason did not demand it, whose word was not relied on and whose character was not respected. Such men, you may say, ought not to be officers—that's true. Certainly they ought not to be preceptors of midshipmen: both Academy and navy should see to that.

Another point. As there may have been at Annapolis once in a long while officers who perhaps were not gentlemen, so on the other hand there may have been occasionally gentlemen who perhaps were not officers; that is to say, the opinion has prevailed among the midshipmen that this or that officer has been detailed to duty at the Academy because the Department at Washington was

[15] North American Review, "A Gentleman," by Arthur C. Benson. March, 1914.

afraid to send him to sea; he was no good on board ship. Whether this opinion was right or wrong is of no import in this connection, what counts is the midshipmen's view. If they conclude that the gentleman is as an officer an ass, the sooner he is detached the better. He, like the other man, cannot benefit the school or the scholars. Still another point. If an officer be known to the midshipmen as Molly this or Sissy that, it would be better to order him to some other shore station.

In allusion to the personality of officers and gentlemen on duty at Annapolis, may be brought up the question whether an instructor should be married or single. A bachelor who has taught for 20 years in school and college has suggested the unmarried man as the more efficient. In opposition it may be said that Dr. Arnold of Rugby, whose moral influence over his boys is historic, had a wife and six children. But the famous Jowett of Balliol College was unmarried, and although he says nothing about bachelorhood, he stated his view of the position he held, as follows: "The head of a college should be identified with the interests of the college. The life of the college in his life. . . . . He is married to the college and has a duty to support his family." [16]

Of course Jowett's words do not imply that a married man ought not to be at the head of a college because marital relations necessarily interfere with an unrestricted devotion to the duties of the position. What he wished to impress upon his readers was his conception of the seriousness of the obligations assumed by the incumbent of the very exalted position he filled, and the compulsion they imposed of undertaking the services connected therewith, with the firm resolution of devoting all his abilities to an intense performance of them with an eye single to the welfare of the college. The Superintendent of the Naval Academy holds a position analogous to that of Jowett's. His responsibilities are quite as grave, his duties quite as exacting. Indeed, they are far more so; for, over 900 midshipmen and their many instructors his moral influence and authority, derivable from the military nature of the organization of the Academy, must be exceptionally powerful and extensive. He ought, therefore, to devote to his task in full measure the noblest faculties and richest talents he is possessed of and should pursue a policy of administration absolutely above

[16] Life and Letters of Benjamin Jowett.

personality. But how can a record of achievement be made when the tenure of office is for too short a time to allow the policy to fructify?

During the 70 years of its existence the Naval Academy has had 23 superintendents—one on an average every three years. And since 1900, when the new navy amalgamation and expansion were begun, it has had seven superintendents—one every two years. It is evidently impossible for a superintendent to accomplish anything of much value in the time allowed him, no matter what efforts he may make; and whatever enthusiasm he may bring to his task of forming the perfect man of a midshipman must give may to a feeling of despair. Hence the reluctance of officers to undertake to fill an office where reputation may suffer and great effort go to waste.

The assertion is ventured that the continuance of the objectionable custom of frequently changing the head of the Naval Academy and the evils consequent thereupon, may be ascribed in large measure to the apathy of the navy as regards the selection of the man and his tenure of the office. No president of a college is appointed to his high position without the approval or concurrence of the alumni; and never is a man elected who can serve for only a year or two. But to head Annapolis, the most important and responsible post in the navy in time of peace, the navy is not called on to make a choice; nor to state its views; nor to express its wishes; indeed, it may be said regretfully, the navy not only has no voice in the selection, but it has no opinion about the matter; concerns itself not in the least; does not care.

Since criticism is creeping in from the fleet and other sources, that midshipmen are not given the best course that could be given them, it becomes the duty of the navy to find out what is the best course and why it is not given; then to insist upon the application of remedies. The navy has the power. It demonstrated this last spring when it forced demoralization and disorganization in the fleet to give way to moral ideas and efficacious methods. It therefore follows that if through strength of purpose officers can compel a recognition of their right to interfere in fleet matters, they surely can, if they so desire, bring equally vigorous pressure to bear on Naval Academy education. And the advice is here and now tendered that they ought to do it. Is not the moral character of Annapolis a moral question for officers to consider? Are they

not responsible for the progress and the development of the sound mind and sound body of Academy education? Is not Annapolis their Academy, their alma mater? "In this world, God only and the angels may be spectators."

X

Mens sana in corpore sano. A sound mind in a sound body —moral and mental rectitude combined in the same individual. The above saying has by a judicious writer been styled "the golden rule of education." About moral rectitude, the heart, something has been submitted; about mental rectitude, the mind, something is now to be said.

From the mind emanate intellect and intelligence. Intellect is the acquisition of knowledge; intelligence is the use of knowledge. An intellectual man may or may not be an intelligent man; he may be only a book-worm devoting his time and talents to study, oblivious of passing events, uninterested in them, incapable of reading their signification. An intelligent man, on the other hand, sees the passing show, comprehends its meaning, himself takes part in the procession. Intellectual men are often very intelligent men; perhaps they usually are; and when the two qualities of the mind are united in a superlative degree in one person a genius may result, like Napoleon. Great intelligence alone implies the ability to perceive and make use of with astuteness the intellectual equipment of others. In this respect Mr. Lincoln may be mentioned as remarkable. In the navy are intellectual men and intelligent men. Some of the former by devoting their talents to promoting scientific matters are not so efficient, perhaps, on board ship as some of the latter—not so practical, not so appreciative of the situation; they cannot build or make anything as well as the latter, cannot understand business as well, cannot command men as well.

The general aim of Naval Academy education is to develop in midshipmen the intelligent side of the naval profession, but in such manner that the importance of the intellectual side shall be perceived without permitting it to imbue midshipmen with the idea that it alone will be sufficient to make for efficiency. The aim of education, writes Professor Hanus of Harvard University, "is to prepare for complete living. To live completely means to be as useful as possible and to be happy. By usefulness is meant

service."[17] Professor Hanus means by service, duty to society. Here in this essay the word is confined to mean duty to society as represented by the military organization at the expense of the individual—duty to the navy; that is what the word service signifies when applied to the educational aims of the Naval Academy.

There are, it would seem at first glance, two conceptions of the aims of military education; and the one conception is apparently opposed to the other. The one is stated by Dr. Pritchett of the Carnegie Institute, whose son graduated from West Point, to be that West Point does not aim at fitting men for a given calling, but to give them along with a certain military training a general education which shall count for both character and intellect. This conception is not unlike Professor Hanus's. Perhaps, however, it may not be that of all West Pointers. The other conception is that of Captain Gibbons, late Superintendent of Annapolis. He told a congressional committee that, "We are educating there (Annapolis) a definite type of man for a definite object in life and that both theory and practice are combined as well as as we can combine them in four years." This conception is perhaps nearer the mark. *Ex Scientia Tridens.*

Both conceptions are, however, fundamentally right. Dr. Pritchett's because success in life for West Pointers, midshipmen and all other men will depend upon the moral and intellectual training given by the colleges. Captain Gibbons' because success as a naval officer—so, too, as an army officer—will depend on the vocational education, moral and intellectual, acquired by combining theory and practice at a government military college—for naval officers the Naval Academy. The first is the broad idea of education and has reference to the whole man, whether he be of the circus, the university or the church. The second is the narrow idea and has reference to making perfect the particular man, the naval officer. It is this second narrow conception which is under discussion in this essay, the means to be employed to prepare midshipmen to become as useful naval officers as possible—usefulness meaning naval service—and incidentally, happy.

The efficacy of the means to be employed in promoting the realization of the educational concept of the Naval Academy will

[17] "Educational Aims and Educational Values," by Paul W. Hanus.

depend on the educational values of the subjects chosen for the furtherance of the aims of the school. The studies chosen are the means; the aims to be advanced by the means, *i. e.*, by the values of the studies, are two: incentives to activity, and power to think and to execute.[18] Incentives when strong inspire the desire to learn well the nature of the subject matter set before the student, in the belief that the interest he takes in the study will increase his reputation and further his ambition as an officer and gentleman. Power to think and to act, when considered in relation to the aims to be advanced by study, is developed through the pursuit of a given subject, and is usually restricted to data of a particular sort. That is to say, writes Professor Hanus, power in physics is different from power in Latin.

The educational values of the studies chosen consist (a) in the scope, kind, strength and permanence of the incentives to activity; and (b) in the kind, degree and permanence of the power to think and to execute which these subjects may develop.[19] The scope, kind, strength and permanence of the incentives of value to the navy must be determined by the activity and interest which can be made to grow out of the study of scientific subjects; and the kind, degree and permanence of the power to achieve results must be the outcome of the power developed through the pursuit of some one scientific subject. Hence the theoretical education of midshipmen aims at being scientific not humanistic, analytical not synthetical, vocational not general.

In essence the vocational education partakes more of the nature of mechanical engineering than of any other kind. Therefore Annapolis is to-day a school of that description, with studies similar to those of other technological colleges; their application, however, relating more specifically to ships and their equipment, along which lines are to be found, writes Admiral Fiske, "The highest expression of the genius of mechanism and the embodiment of its spirit." Here, then, are to be found the incentives of value to spur activity and interest. Next, taking mechanical engineering as a starting point, the paths along which progress may be made—electrical engineering, marine engineering, ordnance engineering, naval construction—are clearly indicated, so that any one of them may be subsequently traveled by attending a postgraduate course

[18] Professor Hanus, "Educational Aims and Educational Values."
[19] Professor Hanus.

in search of *power*—meaning the ability to do something, to bring about results.

Scientific education must rest on the fundamental, essential, all-pervading science of mathematics; and the study of mathematics must precede the study of every other science, inasmuch as mathematics is not dependent on any one, whereas all are dependent, more or less, on it. "If a man's wit be wandering, let him study the mathematics." Hence the emphatic necessity of midshipmen being sufficiently grounded in that study to take up understandingly other scientific subjects of the curriculum, with a view to fashioning their minds into a similitude with mechanical engineers' minds. How much mathematics is needed? Here's the rub again, since here, too, as in nearly all things naval, there is a babel of tongues.

Some years ago a Superintendent gave his opinion and reasons why too much mathematics was taught; but he failed to win over the academic board. Then a board composed of officers not stationed at the Academy inquired into the matter. Their report suggested an increase rather than a decrease. Hence the last state of the non-mathematical student was worse than the first.

Mathematics is an extremely difficult subject to master intelligently. It lays waste more hopes than all other studies combined; the hopes of those who seek admission to the Academy, and of those already there, seeking to graduate. More than half the candidates who essay the entrance examinations fail to pass in mathematics, and more than half of those who do enter Annapolis subsequently leave because of failures in mathematics. There's a reason—insufficient preparation. Perhaps it would be nearer the mark to say improper preparation. For mathematical acumen can result, not from training the memory, which is simply learning by rote, but from training the mind, which is developing the thinking principles, a much more difficult process and one which is shunned apparently by most teachers in primary and secondary schools. First, because often the teachers themselves have been improperly taught and, for example, can no more deduce the rule for the division of fractions than their pupils can; and secondly, because by neglecting to teach principles much time is saved, more ground is hurried over, and teaching is considerably easier. Such teachers, methods and motives cannot fit boys for studying sciences

which need for their apprehension mental penetration instead of memoriter ability, even though as frequently happens an excellent memory may pass a boy in and carry him through to a safe finish. Since the object of mathematical instruction, exact deductive reasoning, like that of geometry, for instance, is lost, the resulting education will be essentially superficial.

At Annapolis it is superficial for the above reason and some others. Among them the entrance examination. In scope, quantity and quality it is and always has been absurdly easy. On this one point there is perfect accord among men in and out the navy. And year after year in recent times it has been made easier in order that the foolish as well as the wise might enter the Academy and take up the gruelling work there. As a matter of fact, however, lessening the entrance requirements has not lessened the percentage of failures. How can it if such elementary questions, for example, as, explain how to subtract one from one hundred without using the word borrow or its equivalent, be flunked by boys of 16 to 20 years of age? Though this question may not have been put, the examinations in mathematics and also, it should be added, those in English, history, etc., are not far removed from it in puerility.

Hear what the late Professor Lounsberry wrote on this subject: "Educated men . . . . are invariably astounded when the nature and extent of the subjects demanded at the entrance examinations . . . . are brought to their attention. The requirements for admission are far below those of institutions of similar character that aim to fit men for the pursuits of civil life." For the sake of comparison the professor places side by side the subjects in which examinations for admission are held at the Naval Academy and at the Sheffield Scientific School of Yale, thus showing the farcical nature of Annapolis requirements. To quote further: "For the ills of the present system the natural and indeed the only satisfactory remedy is to raise the standard of admission. Most of the common objections made to this course are of such a character that one is disposed to apologize to educated men for considering them at all seriously." Nevertheless the objections whether needing apology or not cannot be overridden by the Naval Academy. They are placed in the path of progress by the Secretary of the Navy, he is responsible. But may it not with some truth be said that the navy also is culpable?

To relieve the Naval Academy from future jeers and sneers at the paucity and absurdity of the entrance requirements, the suggestion is offered that in lieu of the present entrance examinations conducted by the Academy authorities under the orders of the Navy Department, the certificates of proficiency from colleges and high schools be accepted. If such procedure were followed the customary complaints by the disappointed candidates and their friends, of the prejudice, partiality and carelessness of the naval examiners would be stilled; and the worry and the wear and tear of mind of these officers would come to an end. But more important than all else, the adoption of the plan would remove forever one noteworthy field of Naval Academy activity from political influence and annoyance—a not inconsiderable desideratum. Is it not possible and proper, even perhaps a duty, for the navy to lend a hand here?

XI

Midshipmen while undergoing instruction in the science of the naval profession are divided for teaching purposes into sections of ten or a dozen men, each section with a teacher in charge for an hour at a time. The method is ideal in conception. It brings to the mind's eye the picture of an instructor and his pupils coming together in close contact for the recitation, discussion and explanation of the lesson of the day " where there is a community of thought, a harmony of effort, a willingness on the part of the student to do his work fairly; on the part of the teacher to make the way as plain as possible." And in the UNITED STATES NAVAL INSTITUTE PROCEEDINGS one reads that: " The methods of teaching at the Academy are good "; that " midshipmen are carefully educated "; that " probably midshipmen use their time to greater advantage than do youth at other colleges "; and so on. All of which is excellent in theory. How is it in practice?

The instructor sitting aloft and aloof from his pupils orders them to the blackboard to place thereon as best they can the contents of the pages of the book they have studied for that recitation. The blackboard work having been finished, the instructor calls on each man to " make explanaish "; and endeavors to arrange the time so that every man in the section shall be heard within the hour. As for taking the work of three or four men as a basis for devoting half the time in class-room to discussion and producing

harmony of effort, to making the way plain—the idea cannot for a moment be entertained. There is no time for instruction of this heart to heart nature. The book is the thing; and the sooner it be got through with the better; for there are many other books awaiting a turn to be learnt. The results of this forcing process are declared by Midshipman Small [20] to be bad. He states that specially prepared text-books in tabloid form are used; that midshipmen must accept fact after fact because the book says so; that the valuable training given by modern educational methods is missed altogether, and that "midshipmen develop a slavish adulation for the book."

If the statement of Midshipman Small be accepted—and no reason can be adduced for rejecting it—it leads to the belief that the educational methods of Annapolis are radically defective, that they do not tend to develop the healthy mind. Too much ground is sought to be covered, the text-books are unsatisfactory, and the instruction is insufficient and—inefficient? Yes, that is the implication corroborated by boards of visitors, by civilian investigators and by a few naval officers. This inadequate instruction is inherent in a system in which a constantly shifting body of officers is detailed for two or three years to perform a duty not in line with their profession. As officers they may be most alert and able on board ship and quite remarkable for scientific accomplishments, but these admirable qualifications for distinction in one line, for power to think and to execute, are not a warranty of success in some other line, like teaching, which calls for technical information and pedagogic talents combined in the same individual, and an exceptionally brilliant personality differing in kind and degree from characteristics indicative of excellence in the naval profession.

A very clear appreciation of a teacher's qualifications is that of Professor Hanus, stated negatively in the quotation following:

> If he is a physical or mental weakling, if he is stolid and heavy, if he is indifferent to nature, human nature, and art, if he lacks enthusiasm in the pursuit of his subject and never feels the glow of conscious mastery, if he has a crabbed or irritable disposition, if he is brilliant but unsympathetic, if he lacks an interest in his pupils at least equal to his interest in his subject, if he has no tact and is lacking in the sense of humor that often furnishes the silver lining to an otherwise black cloud of youthful idleness or seem-

[20] U. S. Naval Institute Proceedings, Dec., 1912, "The U. S. Naval Academy."

ing perversity—in a word, if he is not physically and mentally vigorous, alert and active, if he is not interestedly and healthily responsive to the varied interests of life, if he cannot cherish a feeling of good will and maintain a hopeful and encouraging attitude in spite of many discouragements and some failures—whatever he may be able to achieve in other callings, he ought never to be a teacher.

The description of what a teacher ought not to be lends color to the suggestion that since naval officers cannot be detailed as instructors for a longer period than two or three years, and are not experienced pedagogues; that since when away from Annapolis naval matters must absorb their time and mind, and likewise, though in less degree, when on duty at the Academy, so that they cannot, whether afloat or ashore, because of these professional distractions, keep in touch with educational progress outside Annapolis; that since they are temperamentally unfitted because of mental attitude, naval training and environment to teach with undivided attention and interest a school of young barbarians whose habitat is as unlike that of men on board ship as possible; therefore, instruction in non-naval subjects can perhaps be imparted with greater advantage to the Academy by professional educators from civil life, than by a constantly changing detail of naval officers who attempt earnestly enough, without doubt, to accomplish the impossible.

It has been said that the Naval Academy in organization and system is so far removed from the great body of educators throughout the country as to suffer from the evils of what is commonly called in-breeding. Without doubt this is justifiable criticism. It has been expressed by a few naval officers and by many educators and civilians, all friendly to the Academy. The only remedy for the faults complained of is outside contact, continuous contact, to be sustained by the men of distinction in the Academy keeping in close touch with like teachers of mark, their confréres, in the colleges. The Naval Academy needs, therefore, if progress along modern lines is to be followed, a permanent staff of college professors and instructors, expert specialists, of highest standing, long experience and noteworthy pedagogic acumen in the civil colleges where they may have officiated before accepting the call to Annapolis. Already some civilian instructors have been taken on, but they are too few in number to leaven appreciably the official, inert mass they are up against. However, even to secure

the few has been up-hill work, opposition having come from the very men who might have been expected to do their best to promote such employment. A year or so ago in a competition to fill two vacancies in the department of languages, not a college graduate applied—so it has been stated—although the universities were solicited for candidates. The reason, so reads the information, was that the Superintendent of the Academy was credited with the remark that civilian instructors should not be retained more than three or four years.[21] What this policy would mean for the training of midshipmen, it is unnecessary further to state.

The departments of instruction which, the suggestion is ventured, might with advantage to the educational endeavors of Annapolis be placed wholly under the control of civilians with civilian heads and complete corps of civilian instructors are, mathematics and mechanics, English, modern languages, electrical engineering and physics. In marine engineering and naval construction, there might be a corps composed of half civilian professors and half naval officers with a naval officer at the head, since the naval element would know better the lines to be followed for keeping abreast of the times in naval construction and equipment. It goes, of course, without further saying that in the purely professional subjects life seamanship, navigation and gunnery, instruction must be given exclusively by active naval officers. Also, navy men should direct practical instruction even in mechanical and electrical practice where civilian instructors may lend a hand. The reason is obvious, the training bears directly on the similar practical work to be continued on board ship.

XII

With the nature and extent of Academy instruction, theoretical and practical, some fault has been found. Criticism is creeping in from the fleet and from other sources that Annapolis is not preparing midshipmen for their life work as well as it might, could, would, or should. Wherein is Academy preparation defective? In what respect does it fail to place the mark of the perfect man on its graduates? Some of the critics complain that too much time is given to theoretical subjects and too little to practical matters. Others, too much is given to the practical and not enough to the

[21] The Nation, New York, March 5, 1914.

theoretical. Also, that practical work should be more practical; etc. Nearly every critic suggests something different from every other critic, and something different from what is. 'Tis a many times told tale during 70 years. And it can be hushed only by and with the consent of the navy. Details of the particular things in which the young graduate is not perfect must be given, the why and the wherefore of a desired change in Academy instruction must be distinctly set forth, and there must be some positive agreement as to the best course to be followed to make midshipmen complete creatures after their kind. The question is up to the fleet. Will the fleet tackle the problem seriously and earnestly, determined to find a solution? It ought to.

In some of the articles on the Naval Academy, printed in the UNITED STATES NAVAL INSTITUTE PROCEEDINGS, a comparison is drawn between the engineering course at Annapolis and similar courses in a number of colleges, not at all to the disadvantage of the Academy. There are over 800 institutions called colleges in the United States, many of them empowered to grant degrees. Some of them are little more than real estate ventures, and some, a large proportion, are preparatory schools in whole or in part. Manifestly Annapolis is equal, even superior, to a large proportion of the 800. But with which ones the Academy was likened is not stated—so far as can be recalled. Furthermore, the comparison was made by an interested party. It may be thought to resemble in this respect the opinion of the *Bandar-log* in one of Kipling's jungle stories, who shouted that they were the most wonderful people in all the jungle, they all said so and so it must be true. A more impartial and convincing way to gauge the scholastic attainments of midshipmen over against those of undergraduates in other colleges would be—the suggestion is proffered—to have the parallel drawn by some disinterested body like the Carnegie Institute for the promotion of learning. A report from the nonpartisan experts who compose it, might perhaps indicate that Annapolis had an educational beam in her own eye which would have to be removed before she could see clearly the motes in others' eyes.

Satisfactory results, however, will not follow upon changes in curriculum, method and organization of the educational concepts at Annapolis, be they ever so beneficial fundamentally, unless the

navy approve. In essence the question is not one of superiority over other colleges, in respect of the amount of mathematics and engineering that may be taught, but is only whether the navy be satisfied. Between service and Academy there should be perfect accord, the former indicating the paths to be trod, the latter cheerfully jogging along them. A moral question here obtrudes itself, the Naval Academy must see the right as the navy gives her to see the right. This lays a heavy duty on the service—nothing less than to devote ability, intelligence and intellect to promoting the sound mind of alma mater.

XIII

"'A sound Mind in a sound Body' is a short, but full Description of a happy State in this World. He that has then these two, has little more to wish for; and he that wants either of them, will be but little the better for anything else. . . . . He, whose Mind directs not wisely, will never take the right Way; and he, whose Body is crazy and feeble, will never be able to advance in it." The words are by John Locke (1632-1704). So are the following: "How necessary *Health* is to our Business and Happiness; and how requisite a strong Constitution, able to endure Hardships and Fatigue, is to one that will make any Figure in the World, is too obvious to need any Proof." Among other directions for preserving the health of youth, the philosopher gives this one: "Above all, take Care that he seldom, if ever, taste any *Wine* or strong *Drink*."[22] So!

There are no crazy and feeble bodies at Annapolis; none such are admitted. And the strong that are there are made stronger by compulsory training of an intense and exacting nature which removes superfluous tissue and leaves the young man as hard as nails. To make practical instruction more practical in relation to the professional requirements of service afloat may be possible, but in respect of promoting health and developing physique, of making men strong to endure, Annapolis on the whole, does good work. Her sons go forth in full vigor of sound health, their muscles hardened, their nerves steadied, their endurance tested.

In addition to the regularity of the life midshipmen lead—the routine, discipline, drills, etc.—there are athletics as fully organ-

[22] "Thoughts concerning Education," by John Locke.

ized, as carefully supervised and as steadily pursued as any other activity; and every man must take part in them. There is a Navy Athletic Association composed exclusively of officers of the navy, and a Midshipmen's Athletic Association composed exclusively of midshipmen. The former association exercises jurisdiction over the latter, having an official representative in charge of each branch of undergraduate sport to regulate the training, practice, playing, dates of games, etc.

Athletics at Annapolis present many commendable features. They throw officers and midshipmen into more intimate relations than any other work in which the school abounds, and bring about an *entente cordiale* which helps greatly towards fostering kindly feelings. They animate all hands from superintendent to plebe with the common desire to have the game played for all it is worth —and to win it. They breed college spirit as nothing else does. They stimulate the participants to do their utmost for the glory of the Academy. More than this. Athletics incite the whole navy to take a deep interest in the games. Oldsters and youngsters, officers and men, active, retired, resigned, give them thought and support. From everywhere and from all sides the alumni rouse up, go to the games, get thrilled with excitement, and acclaim the players—especially at football—as joyfully as though they were once again midshipmen. All this enthusiasm and warmth, this hoping and praying for the success of alma mater, though it be but for a short time and only for athletic prowess, draws attention to the Academy, induces the old boys to think of her, talk of her, recall the good old days that are no more, and wish better days for her in the time to come.

There are yet other reasons for praising athletics. They bring the midshipmen into relations of amity as well as of competition with species of the human kind other than their own, those from the colleges of freedom, whose members are undergoing the process of being educated into perfect men of their kind by means and methods unlike those in vogue at Annapolis; and the two species fraternize and interchange views. Sometimes Annapolis has sent her men abroad to engage in contests in distant lands, as it were, where they see strange men and manners, and where the customs, habits and ideals are different from those at the Academy. The mental and moral stimulus of this contact with men of other training and environment cannot fail to broaden the outlook and open

up the minds not only of the Academy athletes who play the games, but likewise of their fellows who listen to the tales the players tell.

Athletics at Annapolis more than at most colleges are valuable as a means of recreation because of the confined life the midshipmen lead and the restrictions of military discipline which necessitates an official oversight of every moment of a young man's time and of everything he does. To relieve the irksomeness of such constant surveillance—felt if not understood—and excite pleasurable sensations, is worth the time and attention midshipmen are permitted to devote to the enjoyment of play. All work and no play makes Jack a dull boy.

That athletics merely as physical exercises conduce to bodily strength and improvement is universally admitted, and on this account it is advisable to support them. Also it should be said their moral effect is valuable; they call for self-subordination, cooperative effort, public spirit, and they bring out dominant characteristics and tendencies as regards temper, disposition and force of will of the participants. But notwithstanding the good that is in them, it would be unwise and shortsighted to consider athletics as constituting anything more than a single stage in the best bodily training in that branch of education designed to give to a man's frame vigor, activity and beauty.

The objectionable features of athletics, those exclaimed against by college authorities and others, may be quickly summed up as follows: The student's point of view has become so distorted that fictitious values are assigned to physical ascendency over mental capability; the adulation given to notable players has exceeded the bounds of reason and common sense; the winning of games has assumed an exaggerated importance at variance with their signification, which is that of healthful amusement and excitement; and they have relegated to insignificance the ability to study hard, stand high and win scholastic honors. But it should be added that the morals of athletics are on the mend. Cheating at games is frowned upon and the scholastic standing of the players has been raised. There is better behavior on the field and in the study, and slowly but surely under the pressure of public opinion, a saner view of sports is coming within the horizon of the undergraduates.

By far the most damaging impeachment of athletics at Annapolis was the charge laid last summer against some instructors that

they discriminated between the athletes and the other midshipmen in awarding marks for intellectual work. Such a charge, if it can be sustained, is shocking; it indicates a deplorable condition of demoralization, and goes far towards justifying the wrong notions of midshipmen in respect to the purport of the games they play. Here is the unhealthy mind and also the unhealthy body even though both be muscular. But doubtless the accusation of unfairness was unfounded, made in the heat of argument, like some other assertions affecting Annapolis, and rests on no solid ground. May be it was never made—except in the newspapers.

Other means of physical development are the professional drills, many of which are competitive and call upon the midshipmen to strive mightily to win the prizes offered; such are the exercises at infantry, seamanship, gunnery and some others. All these when rightly conducted give strength of body and nimbleness of movement. Excellent, however, as these exercises are in bringing the body into condition to stand the wear and tear of life on board ship, there are other measures less strenuous than athletics and drills, which are of still more importance to the healthy body of midshipmen. Of paramount value for instance as a conserver of good health and a sound constitution is the daily routine a man must conform to, the regular hours he must keep, the wholesome food he must eat, the clothes he must wear, the exercise he must take, and the avoidance of every form of dissipation. His cleanliness, his neatness, his carriage, how he must stand, walk and run, the lectures on hygiene he must hearken to; these, together with the perfect sanatory arrangements of his surroundings, the buildings, the drainage, the ventilation, all enter as components of the physical side of the education of the perfect man and give to his frame vigor, activity and beauty, the sound body.

Mens sana in corpore sano comprises in respect of the sound body something more than pertains to the possession of a vigorous frame and physical beauty, it includes the supposition that without the healthy body there will not be the healthy mind, an inference that unless a man have good health he cannot devote his energies undisturbed to matters extraneous to his physical ailments. It also includes decent habits without which a man cannot command the respect of his fellow men; and good manners without which he cannot gain the esteem of his superiors and inferiors

and be accepted as an equal among gentlemen. Behind it all lies the idea of producing a "human thoroughbred."

It has been said of Annapolis that too much attention is paid to things material. Perhaps this may be so if the remark refers to the incompleteness of physical training as regards repose of manner, grace of movement, modesty, quietude, in contradistinction to a rough and ready attitude, boorishness, boisterousness, the result possibly of an exaggerated admiration of athletic strength and material exertion which for the time being count in the undergraduate community as evidences of lasting power. This may be so. No assertion is ventured that it is so. Also it has been said that because of the strenuous and continuous training of four years, midshipmen go stale when joining ships, are listless, uninterested in the work, lackadaisical, cannot "get a move on." All such dicta may be, very likely are, only the fault-findings uttered now and then by some garrulous officer of an unhappy disposition who may fancy his own distemper to be the result of under- or over-physical training at Annapolis; therefore not to be accepted with seriousness. Whether the criticisms which creep into the Academy from the fleet and other sources animadvert on the physical qualities of Annapolis education is not known to your essayist. He submits only occasional rumors. What is the opinion of the navy?

XIV

"For God, for Country and for Yale!" Despite the anticlimax, these words sung by two or three thousand undergraduates and as many alumni, standing bareheaded, are extraordinarily impressive. And the banners with the legends "Class of 1865," of 1875, and so on, and the old men with white hair, and the middle-aged men and the youngsters, all attest more effectively than can words the deep significance and spiritual import of the words the men sing in honor of what they feel they owe their alma mater. So is it at Cambridge, at Princeton, at Ann Arbor, at all colleges. From the circus, the university, the church, the "old grads" go to the campus to give thinks and homage and glory for the education which has made them complete creatures after their kind. How is it with Annapolis?

The reason why a Naval Academy graduate should have a feeling of gratitude, even devotion, for his alma mater is so obvious

as to need no telling. To put it on the lowest ground—as some man said of his college—he is a beneficiary of the institution from which he has graduated. What he got was furnished to him at less than cost. The opportunities which he enjoyed represented charity or a free gift from the state.[23] A midshipman gets all this and ever so much more. He gets his living; he gets his pay; he gets the right to wear a uniform emblematic of service for navy, for country, and for God. To be insensible to all that Annapolis has done for him would argue him an ingrate. It cannot be held to be particularly creditable to a graduate to be loyal to an institution like the U. S. Naval Academy which has no generously supported him and educated him morally, mentally, physically. Not to display his loyalty may be no merit, to be without it would be a disgrace.

Perhaps readers of this essay may gather the impression that the writer has not displayed his loyalty to Annapolis, though he has set down naught in malice, and that his sentiment in return for all his alma mater has done for him is not the most worthy. This is denied. A man loves himself even when recognizing his own limitations; he honors his father and mother even when conscious they sometimes err in judgment. So, too, he is devoted to the navy, though he may on occasion question the expediency of its action, and he gladly offers his life to his country whether he believes her to be right or wrong. Therefore the averment that some of the methods of alma mater may need improving; that some of her positions may not be of the firmest; that her point of view may not always be the clearest, and that some ideals may not be held high enough aloft to be seen and worshiped by midshipmen and by alumni, ought not to warrant suspicions of his loyalty and fidelity to his alma mater. "The best of institutions suffers no harm from weighing its faults against its virtues, if it have virtues enough to send the other scale skyward."

XV

What is the matter with the Naval Academy?

Ask the navy.

In Bunyan there are three sluggards, Simple and Sloth and Presumption. "Simple said, I see no danger; Sloth said, yet a little

[23] The Nation, March 12, 1914.

more sleep; and Persumption said, every vat must stand on its own bottom. And so they lay down to sleep again."

When the navy shakes off its lethargy and awakes to a realization of the truth of the text of this essay, namely: that education at the U. S. Naval Academy has reference to the whole man, the body, the mind and the heart; that its object, and when rightly conducted, its effect, is to prepare him to be a complete creature after his kind, giving to his frame vigor, activity and beauty, and to his heart *virtue;* then will indifference, unconcern, and preoccupation no longer weigh down the eyelids of Annapolis alumni; and clearer than the noonday will stand out the duty officers owe to their Academy. Then, and not till then, will the service know what is the matter with Annapolis. And then, and not till then, will the navy have the right to look to alma mater to stamp upon her sons the hall mark of the perfect naval officer and gentleman—*Mens sana in corpore sano.*

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U. S. NAVAL INSTITUTE, ANNAPOLIS, MD.

THE INDUSTRIAL IN MODERN WAR[1]

By NAVAL CONSTRUCTOR R. D. GATEWOOD, U. S. Navy

THE LESSON

The great military lesson of the present war is the lesson of munitions. The failure of treaty and fort, the increasing effectiveness of great gun and machine gun, the menace of battle cruiser, submarine, and aeroplane, the value of trenches and command of the seas—these, too, are lessons of far-reaching importance, but the greatest is that of munitions.

There has come about a change in the relative importance of the various factors concerned in the prosecution of war, a change not yet wholly realized by those most intimately and vitally concerned. Formerly, it was largely a question of generalship, or numbers and morale of troops, that determined the victory. Now, surely it is no disparagement to the skill of the strategist, to the vigilance of the tactician, or to the valor of the soldier in the ranks, to say that victory will rest with that side which can maintain the combat most vigorously and for the longest time.

The successful conduct of war demands organization to the last detail of *all* the resources of the nation in men and material. It is not only proper but necessary to divert the ordinary channels of trade to make them subserve the needs of the nation. Business should *not* proceed as usual, and the industrial organization should be made to conform to the dire national necessity.

[1] Written October-November, 1915, since which time much has already been done along the lines herein recommended *but no laws have been passed*. The writer considers it essential to enact into law much of the legislation herein proposed. The writer desires to acknowledge, with thanks, the frank criticism and valuable suggestions given during the preparation of this paper by Naval Constr. E. Snow and Asst. Naval Constr. C. L. Brand.

Modern warfare has developed into a national industrial undertaking, as much as a specialized military one. In fact, there is as much for the industrial organizer to do as there is for the soldier. Fleets and armies are powerful only when constant mobility is assured and when the material necessary for their efficient operation can be supplied when and where needed, maintaining at the same time a reserve for a superhuman effort when the progress of the fight requires it.

The great fact is that the effectiveness of military forces is largely dependent upon the efficiency of the industries supplying those forces. In something more than a figurative sense, therefore, we may say that the army and navy can go nowhere unless they are carried there upon the backs of mechanics and factory hands—and who can say which is the more important in warfare, the factory or the trench?

But lest the relative importance of our machine shops, for instance, be not yet appreciated, consider for an instant the Allies' great offensive of September 25, 1915. There were fired in this single engagement over 1,000,000 shells from the French "seventy-fives" alone, some of the guns firing twenty a minute. These shells weigh 18 pounds apiece, so that 10,000 tons of material were expended. As it takes five hours to make each shell, 1,000,000 shells will take 5,000,000 hours, or the work of 625,000 men for an 8-hour day. Four large shops employing 500 men each will require a year to make this number of shells, to be fired in a single day's action. Assuming that 600,000 men are engaged in such an action and that it lasts eight hours, it will take 25,000 more men to make the shell than it does to fight the battle.

The army has organized and coordinated to a high degree the activities of the trench, and its allied accessories, the field gun, machine gun, rifle, bayonet, mine, grenade, pick, and electric wire; as has the navy in the case of propulsive machinery, guns, torpedoes, mines, etc.; but what we have yet to learn, and what European nations learned only as the result of nearly a year of conflict, is to organize the industrial activities for war and to coordinate them with the military activities. The fact that should constantly be borne in mind is that the men in the field and in the fleet will suffer and die in vain if the supply of shot and shell, guns and gear, ships and engines, armor and armament, is not maintained in the fullest measure, and these must be supplied

by the industrial. *Perfect industrial organization will, of course, never compensate for deficient military skill;* its importance, however, due do the large number of forces engaged and to the almost unbelievable wastage of ammunition, guns, transport vehicles, and war supplies in general, has heretofore been greatly underestimated.

LOGISTICS

The details for moving and supplying armies and fleets, including all the operations, except purely strategical ones, conducted outside the field of battle and leading up to it constitute that branch of the military art known as logistics.

In its relation to strategy, logistics[2] assumes the character of a dynamic force. . . . .

The strategic conception may be that of a genius, but if it be not based on a solid foundation of logistic facts, it can have no *force* and will be of no effect, unless, indeed, it lead directly to disaster.

There can be no more striking example of this than the disasters that overtook the Russian armies in the spring of 1915. Their machine shops and powder factories were simply inadequate to supply ammunition in sufficient quantities. The same thing indirectly held true in England and France until the fall of 1915, though to a less degree. In spite of earnest warnings before and even after the declaration of war the Allies were a unit in their belief in the old doctrine that, given a national determination to fight and win, the material energies would sooner or later find their way into the right channels. Early in the war Lord Kitchener announced to workmen engaged in the manufacture of war munitions, " that they, in carrying out the great work of supplying munitions, are doing their duty for their king and country equally with those who have joined the army for active service in the field." At the time this was considered rather as a diplomatic utterance designed to conciliate the labor interests, and its full significance as a statement of fact was not appreciated by either the workman or the nation until many months later.

The doctrine of a " nation in arms " had not yet become generally accepted, but gradually the vastness of the effort entailed in organized preparation for definite military tasks was realized.

[2] Logistics—Its Bearing Upon the Art of War, by Comdr. C. T. Vogelgesang, U. S. N., Proceedings U. S. N. I., March, 1913.

Frequent defeats and the abandonment of repeated offensives due to lack of munitions finally overthrew the established peace-time governments. Coalition governments were set up in their stead, and these evolved the machinery to assure the organization of the national resources. Some delay ensued until all the delicate governmental mechanism could be adjusted to the needs of the occasion, which by then were very pressing, but from this time on material improvement could be noticed in the logistic plans of the Allies.

THE QUESTION

Without further elaboration, then, of those facts with which virtually all military and lay minds agree, let us ask what should be done to organize our industrial resources so as to overcome the delays that have been so disastrous to the cause of the Allies.

The answer, to be complete, cannot be brief. What follows, therefore, must be considered as an outline of what the answer should embrace rather than the answer itself.

THE ANSWER

The actual quantity and the precise quality of munitions needed should first be determined. This estimate should be furnished by the General Staffs of the army and navy, and the importance of accurately predetermining it can hardly be better illustrated than to quote an excerpt from Lloyd George's speech introducing the Munitions of War Bill before the House of Commons the latter part of June, 1915:

> In order to understand the whole depth of meaning of the problem we are confronted with, I would almost say that ultimate *victory or defeat* in this war depends upon the supply of munitions which the rival countries can produce and with which they can equip their armies in the field. *That is the cardinal fact of the military situation.* When the Germans establish a superiority on any front it is due to a preponderance in the material of war. When they are driving the forces of the Allies before them in any quarter of the field it is due to the same cause. When the Allies are making progress in any part of the line it is due to the fact that in that section of the battlefield the Allies have predominance of the munitions of war. . . . .

EXPENSE OF ADVANCE PREPARATION

Having determined the amount of munitions necessary we must see clearly how impracticable and undesirable it would be to

maintain such a stock always on hand. In time of peace no Congress could ever be persuaded to appropriate the money for its manufacture, no sane person would recommend tying up indefinitely so large a fund as would be needed to pay for it, the losses from deterioration would be serious, and vast quantities of stores might becomes obsolete over night on account of new inventions and more advanced practice in the art of making war. This "preparedness against war," upon which so much thought is now being expended, is, after all, purely a *relative* condition. In a concrete sense there is really no such thing. No sooner have the best of rifles been supplied an army than some one invents a light, reliable machine gun, necessitating the creation of a new set of experts for its operation; by this time an improved type of field gun appears, and we must have that too. Aeroplanes, airships, motorcycles, search-lights, and every other device and invention must be provided and men trained to use them. To attempt to realize such a notion is to pursue a will o' the wisp that will lead far astray its most painstaking and vigilant followers. It is not, then, *so much a great reserve in advance as the capacity for manufacturing rapidly and accurately when the necessity arises.*

GOVERNMENT ARSENALS OF NECESSITY INADEQUATE

There has already been a clash between those who feel that this capacity should be provided in government shops and those who would obtain it through private plants. Taking into account the rate at which ammunition is now expended, the former plan would mean the erection of huge plants that would lie idle for long periods. Some idea of the capacity of the arsenals required may be obtained by considering the proposition with which the British War Office was confronted in the fall of 1914:

> The total army estimates had been £28,000,000 in a year of peace. They suddenly became £700,000,000. All that represents not merely 25 times as much money, but it means 20 or 25 times as much work. It means more than that. It had to be done under pressure. The sort of work which, in a business, takes years to build up, develop, strengthen and improve, had suddenly to be done in five or six months. The War Office Staff are a devoted, hard-working, capable lot of men, *but they were not enough.* And there is another consideration which cannot be left out of account—that men who are quite equal to running without a hitch a long-established

business on long-established lines, may not always be adequate to the task of organizing and administering a business 30 times the size on novel and original lines.[3]

Not only would our government arsenals be inadequate, but even such great plants as the Winchester, Remington, Bethlehem Steel, and Baldwin Locomotive, would be unable to supply the huge demands. Moreover, we would always have to take account of the geographical locations of these establishments and the grave possibility of their falling into the hands of an invader. Furthermore, even though we were to consider these and similar large firms as parent plants, it would still be highly desirable to utilize the services of smaller plants for the manufacture of the parts of the various completed articles. The task before us now is not to set up new plants, but to put into effect a practical, efficient system for mobilizing existing plants. In the first instance this resolves itself into a question of organization of industrial plants and of training them to produce certain definite products in the event of war.

DEPARTMENT OF MUNITIONS

At the present time no governmental machinery exists to enable such a plan to be put into operation. It will be necessary for Congress to provide by law for a Department of Munitions. It must be a department, not a bureau, because, among other functions, it will be required to coordinate the needs of a number of bureaus under both the War and Navy Departments, and because nothing less than a department could be vested with the power it would be necessary to give it to perform its function. Its head should be co-equal with the other secretaries and should *not* be an officer of the army or navy. The primary duties of such a department will be to deal with the commercial or business interests of the country, and a civilian in close touch with labor conditions and with rapid and economical production on a large scale would seem to be the man best qualified for the position. His staff should consist of specialists in the army and navy, leading civilian engineers and specialists selected from manufacturing concerns. Provision should be made by law so that, in time of

[3] Lloyd George in speech before House of Commons, June, 1915.

war, any powers or duties of a government department may be transferred to, and exercised by the Secretary of Munitions.

In time of war it should be lawful for the Department of Munitions:

(1) To require that there be placed at its disposal the whole or any part of the output of any factory or workshop of whatever sort;

(2) To take possession of and use for the purpose of the government's naval or military service any such factory or the plant thereof;

(3) To require any work in any factory or workshop to be done in accordance with the directions of the Army or Navy General Staff in order to make the factory or workshop or the plant thereof or labor therein as useful as possible for the production of war material;

(4) To regulate or restrict the carrying on of any work in the factory or workshop, or other premises, or the engagement or employment of any workman on all or any classes of work therein, or to transfer the plant therefrom with a view to maintaining or increasing the production of munitions in other factories, workshops, or premises;

(5) To regulate and control the supply of metals and materials that may be required for any article for use in war;

(6) To take possession of any unoccupied premises for the purpose of housing workmen employed in the production, storage, or transport of war material.

COMPENSATION FOR PLANT IF COMMANDEERED

Should it become necessary to thus virtually commandeer a plant, some measure of compensation should be allowed, which while "not the same complete measure of compensation which you would enforce in time of peace when you take a man's property," should nevertheless substantially recompense the firm for such losses as they might thus be forced to suffer. Certain difficulties are sure to come up that can best be contended with by express act of Congress. The law should consequently provide that where fulfilment of any prior contract is interfered with by the necessity of complying with any requirements or restrictions of the Department of Munitions, such necessity will constitute a

good defence to any action or proceedings against the firm for the non-fulfilment of the contract, so far as it may be due to that interference.

ESTABLISH A REGISTER OF PLANTS

It should be lawful for the Department of Munitions to require the owner of any establishment in which persons are employed to give information periodically to the Department of Munitions, in such form as the department may require, as to

(a) The numbers and classes of persons employed in the establishment;

(b) The numbers and classes of machines at any such establishments;

(c) The nature of the work on which any such persons are employed, or any such machines, are engaged;

(d) Any other data which the secretary may desire for the purpose of his powers and duties.

The Department of Munitions should also have access to such information in the hands of other government departments as may have been collected under the National Defence Secrets Act.[4]

The department should then record these industrial resources by preparing a file, containing the names of firms and the contemplated articles of parts which each is best equipped to manufacture. When the data thus obtained have been carefully analyzed, it will be found that the business of munition-making will be absolutely new to a great many concerns well equipped for it; the next step is then to inform all firms as to precisely what they may be required to do. For this it would be necessary to call upon the technical Bureaus of the War and Navy Departments for a suitable number of detailed plans and specifications, and even samples, for distribution. It would be advisable to organize certain factories to produce jigs, gages, etc., so that when new and untried factories are called upon, standard jigs and tools could accompany the order so that the work could proceed without delay. It would also be advisable each year to place a small order with as many different firms as possible for maintaining the stock of those items they might be called upon to produce, and to establish an "Acceptable List" of those firms

[4] Act March 3, 1911, 36 Statutes, 1084.

whose product was found to be uniformly satisfactory. In his splendid campaign of mobilization of England's manufacturing resources, Lloyd George was everywhere met with this query:

> Tell us what you want to do. We are all right; we are all willing; we are all eager. It is not a question of there being any sort of delay, as far as we are concerned. It is not a question of our having any disinclination to place our shops at your disposal, but we want to know exactly what it is you are asking us to do.

DECENTRALIZATION

In the practical application of this plan it will soon be appreciated that the geographical size of the country will involve endless delays in communication, and in time of war it will be impracticable from one central authority to give decisions on the great number of details that will require immediate settlement. It is suggested, therefore, that we resort to decentralization to the extent of establishing a suitable number of "munition areas," not less than 10, each to be served by a responsible representative of the department, who should preferably be an expert civilian engineer in close touch with local business men and labor conditions. He should have an "organizing secretary," and representatives of the General Staffs of the army and navy should be associated with this office in such a way that it would act as a "clearing house for work, for labor, or for information."

REGISTER SKILLED MECHANICS

In each munition area an accurate register should be kept of all skilled mechanics and miners (with special reference to supervising artisans and draftsmen), who could be employed on the production of war supplies. Arrangements should be made with recruiting officers of the army and navy through their respective departments, to exclude from enlistment those men who would be of greater value in industrial than in military service.

BADGES AND DILIGENT SERVICE MEDALS

The Secretary of Munitions should be authorized by law to establish rules in time of war, relative to the issuance and wearing of badges or other distinctive marks by persons employed on munition work, and to prescribe penalties for the misuse of such badges.

A nation-wide campaign should be undertaken by the department to educate employers and workmen as to their national obligations when working on munitions. The importance of keeping full time should be brought home to men of all classes. In the manufacture of war supplies many different trades are involved, and broken time or absenteeism of employees in one trade holds up the work of many other trades with consequent delay in the completion of the ship, gun, or projectile. As an incentive toward good time keeping it would be advisable to authorize the issuance of "diligent service" medals and premiums for steady attendance and efficient performance during a war.[5]

ISSUE SHOP REGULATIONS

The secretary should have full power in time of war to issue regulations relating to order, discipline, timekeeping and efficiency in shops and mines producing war materials. Penalties should be prescribed for their infraction, involving fines or imprisonment. The following rules used during the war in British factories indicate the nature of the above regulations:

Regularity and Diligence.—Every person employed in the establishment, whether on time, piece, or otherwise, shall attend regularly and work diligently during the ordinary working hours of the establishment, and a reasonable amount of overtime (including week-end work), if required, unless he has previous leave of absence for holidays or otherwise, or is prevented by sickness or some other unavoidable cause, which shall be immediately reported.

Suspension of Restrictions.—No person employed shall insist, or attempt to insist, on the observance, either by himself or by any other person employed, of any rule, practice, or custom tending to restrict the rate of production of any class of work, or to limit the employment of any class or person, or otherwise tending to restrict production or employment.

[5] London Engineering for January 22, 1915, states that "Out of detailed returns received by us, embracing 10,505 workmen, exclusively engaged in manufacturing war munitions of almost every kind; in a recent week the normal working time aggregated 63,027 days and the firms arranged for a total of 4524 days of overtime—of course at increased rates of pay. Thus the aggregate possible time became 67,551 days, but the time actually worked was 56,252 days, there being an aggregate in this one week of 11,299 days of idle time, equal to 16½% of the possible total. Needless to say all the overtime was worked, as for it extra pay was got. For every day of overtime worked the men remained idle for nearly three days of ordinary time.

Sobriety and Good Order.—No person employed shall (a) be the worse for liquor in the establishment or bring intoxicating liquors into the establishment. (b) Refuse or neglect to obey the lawful orders of any person having authority over him. (c) Create or take part in any disturbance in the establishment, or use abusive language or otherwise interfere with or annoy any other person employed in the establishment. (d) Tear down or deface any regulations, rules, or other notices posted in the establishment in pursuance of the Munitions of War Act.

PROVISION AGAINST LOCK-OUTS AND STRIKES

The law should provide that an employer shall not declare a lock-out, nor shall any employees take part in a strike, in connection with any difference as to wages, or working conditions, unless such differences have been reported to the department and at least one month has elapsed without settlement. Heavy penalties of fines or imprisonment should be set covering such strikes and lock-outs.

Employers, unions, and individual workmen should all be made to realize how necessary is this regulation of their function. After all, in every phase of communal life voluntary action is exceedingly limited. All law is compulsory, and trade unions themselves are the very essence of compulsion. It is manifestly unfair to require men to undergo the rigors and risks of life in the trenches without at the same time requiring their comrades in the shops to exert themselves to the utmost under rigorous rules. These latter should not be free to work only when it pleases them. Clearly, in time of national stress, the liberty of the individual must be restricted according to the needs of the nation. Here as elsewhere compulsion, in itself, is an evil thing, but with the nation at war there is more at stake than the health of the individual, more than the cherished and often justifiable principles of trade-unionism.

LIMITATION OF OUTPUT

There is a further very important phase of the trade-union problem to which reference must be made—that of restriction of output. Trade-unionism in its attempt to pull down the individual output to the class level has prescribed certain rules, perhaps essential in peace time, for the protection of the workman from undue pressure and strain. There is little doubt that if these rules were suspended for a long course of years, the men in

certain establishments would be unduly exhausted. These rules are unquestionably founded on the necessity in normal times for the protection of labor against undue claims upon its strength. They take a variety of forms, such as limiting the daily unit output per man, prohibiting unskilled labor from performing certain classes of work customarily performed by skilled mechanics, or prohibiting one man from tending more than one machine.

There are those who believe that this important matter can best be solved in a democratic form of government like ours by certain working agreements during war time between the department and labor leaders. They forget that in many cases the men become quite intractible. Moreover, the tenure of office of labor leaders—their very source of sustenance—depends entirely on the good will of the men, and any "voluntary agreements" can only proceed a certain way along the line of forcible action before the leaders must ultimately yield to influences sure to be exerted by competitors for their posts.

With the nation at war it would be a grave and wholly unjustifiable concession to recalcitrancy, if the law did not forbid under penalty of fine or imprisonment, or both, any rule, practice, or custom tending to restrict production or employment in munition plants and mines.

There are, of course, two sides to this question, and before such a law can be passed it will be necessary to dispel the fear of the men that the employers will make exorbitant profits, and to assure them that labor conditions prior to the war will be resumed upon the advent of peace. Until we can satisfy these two conditions, we cannot consistently demand the maximum efforts of the workmen.

CONTROL OF PROFITS

The problem of limiting the excessive profits that are possible in the business of munition-making is perhaps the most difficult of all to solve; it begins in time of peace during "the preparation for defence" stage. We all know the vast strength and influence of the great armament firms, and many of us know, too, that there have been grave scandals in other countries, even including the inciting of conflict, to further the sale of arms and munitions. After war has been actually begun, the possibilities for individual profits become almost limitless, and under such condi-

tions it is hypocritical and wholly inconsistent to call workmen unpatriotic for demanding shorter hours or increased wages proportional to the increased profit secured by their employers. It is a hard statement, but it is nevertheless true, that there are always a few who are ready to take advantage of the necessities of their country even in time of war. Excessive profits paid on munitions add materially to the inevitable burden of taxation that later must be shared by the laboring class, the soldiers and sailors who return from the front, and the dependents of those who have lost their lives in defence of their country. It becomes, therefore, imperative for the law to provide that if the Secretary of Munitions considers it expedient for the purpose of successful prosecution of the war that any munition establishment, in whole or in part, whether original contractor, or sub-contractor, should be subject to special limitation of employers' profits, he may declare that

(1) The companies engaged on such munitions can earn a return on their capital only one-half more than in the three complete financial years preceding the outbreak of the war, determined in accordance with certain rules to be made by the secretary with regard to value of plant, depreciation, etc.[6]

(2) Any excess of the net profits so determined should revert to the treasury.

It is realized that this legislation and departmental regulation of employers' profits and trade-union principles, even though impartially imposed on employer and worker, borders very closely upon a violation of certain fundamental principles of our government; but war is itself the quintessence of fundamental principles and accounts it a grievous waste of time and effort to deal with less.

There are extremists who advocate the absolute control of such plants by central governmental authority, fixing the salaries and wages of all those actually assisting in production, allowing for depreciation, but limiting the profit to a low rate of interest on the capital invested, if not eliminating it altogether. They argue that when the life of the nation is at stake, which means the

[6] England allows only one-fifth more than in two previous years, but this seems less than justified by the wear and tear on the plant equipment working shifts at high pressure, the increased gross business, and the desirability of retaining a material incentive toward maximum of production.

business life of the manufacturers as well, there should be no question of individual profit. The question, however, is essentially a practical one, and the foregoing appears to present the most reasonable compromise.

LABOR CONDITIONS TO BE RESUMED AFTER THE WAR

To insure that labor conditions existing prior to the war will be resumed afterwards, the law should specifically provide that

(1) Any departure, during the war, from the practice prevailing in shops, shipyards, and other industries prior to the war shall be only for the period of the war.

(2) Any change in practice made during the war should not prejudice the position of the workman with an employer or with a trade-union in regard to the resumption and maintenance after the war of any rules or customs existing prior thereto.

(3) After the war preference as to retention of employment should be given to those who were in the establishment prior thereto.

EMPLOYERS ENJOINED AGAINST COMPETITION FOR LABOR

It should be especially noted that nothing thus far suggested militates against the maintenance of a free market for labor, and the workman can still sell the only commodity he has, namely, his labor, in the open market. In time of war the demand for skilled labor will be greatly in excess of the supply, and to prevent a ruinous competition between employers for each other's workmen, and to maintain a high sense of discipline, so that a workman who has refused to obey a reasonable order in one plant may not walk over to a neighboring plant and be employed without being questioned, the law should provide that no person should give employment to a workman whose last previous employment has been in connection with munitions, unless he holds a certificate from his last employer that he left with the employer's consent, or for reasons satisfactory to the local representative of the Munitions Department.

CONTROL OF MATERIAL

In addition to these regulations regarding the shops themselves, and the machines and labor for production, it will be necessary

for the department to include in its control the raw material fabricated in these shops, even to the extent of declaring an embargo against exportation. These will embrace such war staples as coal, cotton, copper, iron and steel, food-stuffs, certain chemicals, etc. The department should be regularly and accurately informed as to the stocks of raw material or metals on hand and in prospect. With this object in view it should require monthly returns from all large users and producers. From the data thus obtained it should be possible to follow accurately the past, present, and future output of munitions. Such control will ensure that available material is not wasted on non-essential work, and that material is not stored merely for the purpose of securing a higher price later on.

ESTABLISHMENT OF TRIBUNALS

As soon as a start is made toward putting into operation the provisions of the foregoing plan, it will be found that a number of extensive changes are necessary in the ordinary business world. Numerous disputes and differences must consequently be expected to arise, and in order that they may be settled with a minimum of lost time, it is proposed that there be established by law in each "munition area" a District Munition Board, appointed by the Secretary of Munitions, and consisting of a chairman, three members representing employers, and three members representing the workmen. At each large plant and in such other locations as the district representatives of the department in each munition area may direct, there should be constituted a Local Munitions Board to which should be referred all minor matters. This local board should have power to impose fines but no sentence of imprisonment. All matters that cannot be settled to the satisfaction of all concerned by the Local Board should be referred to the District Board, which should have power to impose both fines and imprisonment, and when the decisions of the District Board have been approved by the department, they should be considered as final. To ensure uniformity of practice by all these boards, and to aid in arriving at quick decisions, which will be imperative, the law should provide a schedule of fines and punishments for the most probable offences.

CONCLUSION

We of the army and navy have little to do with shaping the military policy of our government, but we will unquestionably be held responsible for safeguarding the country in time of war, regardless of what the policy of our government has been. This can no longer be assured by the mere skillful handling of armed forces, or the performance of valorous deeds by men well versed in the military art. The industrial must always be subordinated to the military; and logistics must ever be less important than efficiency of higher command; nevertheless, skill and valor will not suffice, but must be supported with every industrial resource of machinery and organization. We have all the essential resources; we possess more than one-half the tools of industry of the entire world, and we produce every mineral that is needed in industry. Let us then develop the needed organization with the least delay possible. Even if our navy is not strong enough to keep sea lanes clear, we need depend on no imports whatever; we occupy a stronger financial position than any other nation; we possess a genius second to none for invention and the mechanical arts. We need but to organize industrially. The development and administration of this organization is essentially a problem for the business men of the nation. The rôle of the government is that of a great directive force, supplementing in every possible way the experience and ability of our business men and engineers.

The lines along which this organization should proceed have been indicated. Its existence will materially increase the effectiveness of our military forces and induce a greater respect for them in foreign Chancelleries. If we adopt it we menace the well-being of no other country, we but add to that visible expression of efficient military force that alone can guarantee peace, and we proclaim to the world that we too have learned that the great military lesson of the present war is the lesson of munitions.

U. S. NAVAL INSTITUTE, ANNAPOLIS, MD.

EMDEN

By Lieutenant Hellmuth von Mücke
Executive Officer of Emden

Free translation by Lieutenant J. H. Klein, Jr., U. S. Navy

I. The First Prize

"All hands on the quarterdeck" was piped by the boatswain's mates throughout the ship. Soon the entire crew was assembled on the quarterdeck. And each man knew what was coming.

About 2 p. m., August 2, 1914, while cruising in the middle of the Yellow Sea, Commander von Müller appeared on the poop, holding in his hand a telegram such as we used for radio reports. Six hundred eyes eagerly watched the lips of the captain, as he began:

"A radio has been received from Tsingtao as follows: 'His Majesty, the Kaiser, has, on August 1, ordered the mobilization of the entire army and navy. Following an invasion of German territory by Russian troops, the Empire now finds itself embroiled in war with Russia and France.'

"What had been expected for years has now actually occurred. Without making a formal declaration of war the enemy hordes have invaded Germany.

"The German sword has remained sheathed for 44 years, even though in that period we had many favorable opportunities to conquer. But Germany has never striven for conquest by violence. In peaceful rivalry, by industry and work, by trading and commercial efforts, by lofty ideals and culture, by honesty and thoroughness, it has won itself a position of honor among nations. And this is begrudged us by those who could not do likewise. This envy, strengthened by the knowledge of their own inabilities and their endeavors to excel the success of Germany's peaceful pursuits, in education and training, in technique and science, in

short, in all the high standards of its civilization and culture, this envy has now moved them to unleash the furies of war and to dare to trust to the sword to solve the problem which was beyond their mental and moral capacities. It is now our duty to show that the German nation, sound to the very core, can also survive this test.

"The war will not be an easy one. For years our enemies have been preparing. 'To exist' or 'not to exist' must be our watchword. We will prove ourselves worthy of our ancestors and forefathers and resist to the end, even though the entire world rise against us.

"I intend first of all to make an attack in the direction of Vladivostok. 'Commerce destruction' is our principal rôle. To the best of our knowledge, the Russian and French men-of-war are gathered near Vladivostok. Therefore, it is quite likely that we may fall in with them. In that case I know that I can safely rely on my entire crew."

Three cheers for H. M. the Kaiser resounded over the broad surface of the Yellow Sea. Then followed the order, "Clear ship for action," all hands going to their posts.

And so we were at war. The "cry for revenge" from the west that has not ceased for decades; the cry that grew especially loud since Germany dared to reannex the ancient Germanic territory that had been snatched away from her by the French pirates during the 200 years of weakness and rebellion, this "revenge cry" has done its work. The bronze die is cast. But this time it is not because of Alsace-Lorraine. Now there is more at stake. First of all, only France and Russia had to be considered. But for many long years it gradually became apparent that behind these stood a third nation, the enemy of all, that for centuries had spilled the warm red blood of all other nations for her own interests: England. After forcing France to her knees in the middle 90's at Fashoda, and humbling her to the very dust because she dared cross England's plans for colonizing Africa, and, after permitting Japan in 1904 to strike a blow at Russia who was becoming uncomfortable in the Far East, she then directed the minds and thoughts of these two now no longer rivals, to seeking in some other quarter that compensation which English greed of power and money denied them in Africa and in East Asia. The humbled France and the defeated Russia must now be used to serve her to

attempt to whip Germany. The youthful strength of the German Empire is her most irksome competitor. She could not peaceably compete with our knowledge and technique, our commercial and industrial abilities. Step by step all over the world the Union Jack had to retreat before the colors of our Empire. Peaceful competition does not exist in England. The poisonous slander against Germany which she spread over the telegraphs and cables of the world did not have the desired effect. England's money-bag was in danger. Hence the old principle: "Sink, burn, destroy." She had not yet decided how she would accomplish this. Should she, following her ancient custom, embroil the others in war so that, in the meantime, she could have a free hand in stirring up trouble? Or should she herself take part in the war, fearing that the strength of her credulous and dazzled victims alone was not sufficient to attain for her the goal she wished? England had no well-founded reason for declaring war on us. But, as the saying of these island-folk goes, "that made no difference." They are never at a loss for an excuse whenever one becomes necessary. Justice and law are then treated with indifference, and a hypocritical cloak is always to be found under which to hide her dealings.

What did the famous English statesman, Lord Derby, say in Parliament in the middle of the 19th century in regard to his own people? He said: "We treat friendly nations shamefully. We insist upon the full meaning of international law, when it suits our purpose; at other times we shrink away from the provisions of this law. The story of 'The Rights of the Sea,' which I would like to call 'The Wrongs of the Sea,' is an indelible sign of the unbridled egoism and the covetousness of the English nation and its laws."

So much for Lord Derby.

All nations of the earth have felt proofs of England's covetousness and unbridled egoism. One thinks of Spain, whose growing commercial and colonial power was destroyed by the English sword, still enduring the thorn in its side—Gibraltar—which it had to surrender. One thinks of Holland, whose riches were despoiled by the blood-sucking English, who still has England to thank for changing her former grandeur and power to her present comparative insignificance, one thinks of Denmark, whose fleet was surprised and sunk in the middle of peace in 1807, and whose

principal city, bombarded by English guns, was set afire while nobody was thinking of war, one thinks of China that had a war thrust upon her in 1840 because she was struggling against the English bartering of opium, one thinks of Egypt, that was stolen from Turkey and is now constrained to buy its bread at a high price from England in order to swell her income, because England found it profitable to discourage the cultivation of cereals in the fertile wheatfields and to substitute cotton therefor in order to be independent of America in this respect, one thinks of India where pestilence and famine and the payment of a yearly tribute of one and one-half milliards are the blessings of English culture, against which the downtrodden and impoverished people are vainly struggling, one thinks of the Boer states, which became slaves to England, because they possessed gold veins and diamond mines, one thinks of Turkey, whose territory England has been dividing up for a long time, of France, who suffered the humility at Fashoda, of Russia, having Japan set at her throat, of Portugal, that is merely a vassal of England, of Italy, who is not permitted to expand in Africa, of America (U. S.), whom England tried to forbid the construction and fortification of the Panama Canal, the reasons being known to the whole world only through English sources and according to the English point of view. Having lost her political power over America, in accordance with her old principle, "Ignorance is the proper power to use in combating spirits and nations," she surrounded the "free people" with such clouds of lies sent over her cables that the Americans no longer may even think in "American," but must now think only in "English." In regard to thinking and judging, Americans are bound by the same English slavish yoke that England forced, by the sword, upon all other political powers. And what was it that the Englishman Thomas Carlyle said about the English love of truth? He said: "No Englishman will longer trust the truth. For 200 years he has been hemmed in by lies of all kinds. He considers the plain truth to be dangerous, so he endeavors to modify it (truth) by accompanying it with lies, and yoking the two together. That is what he calls 'adopting the safe middle course.'"

There exists hardly a nation on earth that England has not politically and morally chained to slavery by reason of her unbridled egoism and covetousness. The German Empire alone avoided this fate. There are France and Russia, who, because of

the regicide at Sarajevo, were made her tools and accomplices in order to carry out the English purposes. And should they be unable to accomplish this, then England herself will also jump in. Subterfuges, in order to attack Germany, can readily be invented by England and the world. Worthy reasons can easily be found. Two hundred years ago they gave the candid reason, "to destroy Dutch trade," but such a reason will not, above all things, be given by any Englishman at this time. At that time, when they were seeking grounds for war, the English Admiral spoke up: "Why hunt for reasons? What we need is a larger share of the trade which is now possessed by the Dutch. That is sufficient reason."

And now the same thing is applied to Germany. As far back as 1897, the English periodical, *Saturday Review,* spoke the truth clearly enough when it said, "England's prosperity can only be assured by the conquest of Germany. In case Germany were exterminated to-morrow, there would, the following morning, be not a single Englishman on earth who would not be so much the richer. Nations have fought for years over a state or a matter of succession (to a throne)—must they not now carry on a war over the yearly trade of so and so many milliards?"

Yes, she will go to war at the proper time, the time most propitious to her. Whether the time be now or later, whether it be by immediately jumping into the armed conflict, or not until the end of the war when Germany has been weakened, but she will surely come. It is her war, which she has been stirring up for many years. The last free country must now be given proofs of England's unbridled egoism and covetousness.

"Battery ready," "torpedo-tubes ready," "engines and auxiliaries ready," "repair party ready," "steering-gear ready," "signal and radio apparatus ready."

These reports were made one after the other in such rapid succession that I was torn from my thoughts. A hasty inspection of the ship and then I could report to the captain, "The ship is cleared for action."

At 15 knots we steamed toward Tsushima Straits. War watches were set on the *Emden* as darkness approached. This was done as follows: One-half the crew stood watch at their stations for action at the guns, searchlights, lookout, torpedo-room and in the engine- and fire-rooms, while the other half were permitted to sleep in their clothes ready to hasten to their stations in case of necessity. The

captain took charge of one watch, the 1st officer of the other watch.

The *Emden* was heading northward toward Tsushima Straits. The night was pitch dark, no moonlight. Nothing could be seen in the distance. Of course the ship was darkened. All lights visible from outboard were covered and torching at the smokepipes avoided.

Much phosphorescence, caused by the moderate speed, lighted up the sea. The swirling water, caused by the propellers, showed up as light-green streaks which could be seen far astern of the ship. The high waves climbing over the bow and breaking over the ship's sides amidships, throwing spray in all directions, covered the ship so that she looked as if she had been dipped into a red-green gold. Various large surfaces of elongated forms were sighted in the water so that the lookouts repeatedly reported submarines in sight. At 4 a. m. the port watch, which I commanded, was relieved. The captain took charge. Day began to break. I had hardly reached my room and prepared to get some sleep when I was awakened by the shrill calls of the alarm bells and the loud stamping of many running feet. "Clear ship for action," was passed from one compartment to another. And now everybody was ready at his battle station. Were we really lucky enough to meet a Russian or a Frenchman on the first day, as our dispatches indicated them to be in the neighborhood of Vladivostok?

The vibration of the ship indicated that meantime the engines were working up to high speed. In the gray daylight we saw, dead ahead, a large vessel, lights out, that appeared to be a man-of-war. The captain was approaching her at full speed. The ship had hardly seen us when she came about in short order and headed away from us. Heavy black clouds issued from her smokepipes, a sign that her engines were working at full power. The pursued vessel immediately set a course for the Japanese Islands, about 15 sea-miles away. A heavy smoke cloud hung close to the water and soon enveloped us entirely. As we could see only the mast heads, we had no means as yet of recognizing the ship. But her actions clearly showed that she was not a neutral vessel. Of this, however, more later.

Meantime it became light. The signal, "Stop at once," flew from our foremast. As the order did not, after a certain time, produce results, it was followed by a blank shot, and, as even this

did no good, we fired a few shells at her. There was now no more use of the steamer's trying to reach neutral Japanese waters. When our shell fell close aboard her, she stopped, turned around and hoisted the Russian flag at all mast heads. And so, in the first night of the war, we took our first prize. It was foreseen, on the whole, that this would be the first German prize. She was the Russian volunteer steamer *Rjesan*. During peace she plied the passenger trade between Shanghai and Vladivostok. During war she would be armed and used as an auxiliary cruiser. She was a brand new, speedy ship, built at the German works of Schichau.

The *Emden* and her prize rolled considerably in the heavy sea. It was not a simple matter to lower the cutter which was to carry the prize crew from the *Emden* to the *Rjesan*. The boat was in great danger of smashing against the ship's side. But everything went well. Soon we saw our prize officer, followed by several men armed with pistols, climbing the gangway. The Russian flag was hauled down. In its place the German flag was hoisted. As the steamer could be of use in many ways—it could have been converted into a beautiful auxiliary cruiser—the captain gave up the idea of destroying her and decided to take her to Tsingtao. At 15 knots we proceeded to the southward. Behind us, in column, followed the *Rjesan*. On her was a prize crew, consisting of one officer and 12 men, in order to supervise the handling of the ship, machinery, etc., according to our orders.

The Russian captain made two strong protests against our taking her. She was a peaceful merchantman and it was therefore unjust to divert her. Above all he did not understand this. His knowledge of the rights of the sea was pretty weak. Our question as to why he had attempted to run away from us he allowed to remain unanswered. The captain had him informed that his fate would be decided in Tsingtao.

The *Emden* did not take the shortest way there. Hardly had the captain of the prize noted this than he again protested, desiring to be brought to port by the shortest route. His reason, naturally, was that he feared we might encounter other Russian ships on the course we were now steering. And that was exactly our intention. We had no news as to which courses the Russian vessels were taking, but, from the strenuous protests of the captain, we concluded that we might have an opportunity of capturing one or two more. Unfortunately no more were sighted. Of course his protest was not heeded, but instead our captain had him informed

that the proceedings of the *Emden* were none of his business and further advised him of the results that might follow his continued obstinacy. After that we heard no more from our Russian neighbor. He must have felt confident that our promise to him would be carried out.

According to newspaper reports we discovered that the French fleet, consisting of the armored cruisers *Montcalm, Dupleix,* and several torpedo-boat destroyers, should be cruising about Vladivostok. We dared not meet these in daylight. As we rounded the southern extremity of Korea the lookout in the top reported—"Seven smoke clouds to starboard." In order to be absolutely sure, the captain sent me to the top. I also saw seven distinct smoke clouds and the upper part of the superstructure of a small vessel that appeared closest to ours just over the horizon. When I reported this the captain gave the order to turn away. We made a big sweep and cruised completely around the enemy. We arrived at Tsingtao without having been annoyed.

En route we picked up a very interesting radio message. The esteemed Reuter Bureau, known all over the world for its love of the truth, sent a message which informed the shuddering readers, "*Emden* has been sunk." We also shuddered to the marrow.

During the coming night our prize caused us a little more trouble. Naturally she also had to darken ship. But that was easier to order than to accomplish. On board the steamer were numerous married women passengers who were in great fear of what the barbarous hordes of Germans might do to them. Most of them were fat Russian Jewesses. Every few minutes one of them would turn on the lights in her cabin, so that finally the prize officer had to break the electric circuit at the dynamo. Thereupon they began to wander about with open lights which naturally could also not be permitted. On arrival at Tsingtao, the *Rjesan* was overhauled. The ship was still brand new, so that the Russians had not, as yet, had sufficient opportunity to ruin the good German machinery. Our prize could still do better than 17 knots. Therefore she was equipped with guns, manned by a German crew and set out as an auxiliary cruiser under the name of *Cormoran.*

TRANSLATOR'S NOTE.—The old German gunboat *Cormorant* was being dismantled at Tsingtao. Her captain and most of her crew were transferred to the newly converted auxiliary cruiser *Cormoran* (ex-*Rjesan*), which sailed from Tsingtao and eventually interned at Guam.

Tsingtao was given over to war preparations, the mine fields had been planted, the land fortifications along the coast were manned, and feverish work was going on in the harbor. A great number of German steamers lay inside the mole. Some of these were also being fitted out as auxiliary cruisers, some were being filled with coal in order to act as tenders to the squadron. Our captain received orders here from our squadron commander, Count von Spee. This squadron, consisting of the armored cruisers *Scharnhorst* and *Gneisnau* and the small cruiser *Nurnberg,* was in the South Sea steaming northward. The *Emden* was directed to intercept the squadron at a predetermined rendezvous in the South Sea.

II. To the Southward

That day and all through the night all hands aboard worked feverishly. We had to coal, taking on as much as we could possibly hold, receive a great quantity of all sorts of material; increase our personnel, and make all the many preparations for war. At sunrise the next day the *Emden* left Tsingtao, followed by a great number of German ships that were going forth to meet the squadron. In the harbor there was much enthusiasm. Everybody on land envied us. As long as the war existed only with France and Russia, Tsingtao would hardly be concerned. Likewise it was unnecessary to worry about the state of the land fortifications. On the sea side were good and sufficient works that could not be destroyed by ships. The land forts, inasmuch as only a few had been constructed, were merely small and unpretentious earthworks, solely for infantry usages. Still, an attack on the land side was not to be feared as Tsingtao was entirely surrounded by the neutral territory of China.

Calm, clear weather prevailed as the *Emden* slowly steamed out of the inner harbor. Our band played "The Watch on the Rhein." The entire crew was on deck and joined in singing. Cheers were given on all sides. All were highly confident. Here was reproduced on a smaller scale, the same war-enthusiasm as was being shown in Germany.

The *Emden* proceeded cautiously through the openings in the mine fields. The sun had just risen. There lay Tsingtao, the crown of the Far East, golden red in the light of the first sun rays of the young day. A picture of peace. Along the beach

were long rows of clean, artistically constructed houses. The whole overlooked by the Signal Mountain. In the background were the brown stone mountains covered with a new dress of fresh, young and green forests. The church tower and its cross stood forth prominently in the light, reddish vapors of the morning haze. Further to the right the pretty and clean barracks, the government house, the bathing beach. The whole picture circled with white, the surf arising from the heaving bosom of the sea and breaking on the cliffs along the coast. Glittering pearls and diamonds were strewn in full measure by Neptune on this precious gown of nature. The charms of the farm and German industry have here produced a picture of fairyland where previously had been such a useless and rough region. All of us were in very sentimental moods. But the service called with an iron "must." Therefore tear yourself from this picture! On to the south!

The steamer *Markomannia* followed us, the other steamers steering different courses. *Markomannia* remained a faithful follower to us for several months.

On the way to the South Sea we received the radio telling us of the rupture of diplomatic relations between Germany and England and of the declaration of war by England. We were not surprised at this, and if we were a little astounded, it was due to the fact that the wire-puller of all evil had, for the first time in a hundred years, brought her own bones into danger. A few days later we were notified of the ridiculous ultimatum of Japan; which did not disturb us very much. A clean-up, that was the intention of them all.

On leaving Tsingtao, war with England and Japan had not yet been declared. Later on we read in the English papers that our escape from Tsingtao was only due to the fact that in passing a Japanese armored cruiser on blockade we hoisted the English flag and gave three cheers to our allied brothers.

Does this report originate perhaps in the suggestion that the English and Japanese men-of-war were already on their way to Tsingtao before war was declared?

In any event the whole report was perfectly ridiculous. Entirely apart from the subject, that we ever disgraced our good ship by the hoisting of the English rag, we most certainly would not have missed the chance, when passing the Japanese, of sending him a torpedo greeting.

It is strange how systematic lying will harmonize with logic.

During the evening of August 12, we came in the neighborhood of the island where we expected to meet the cruiser squadron and found the outpost vessels. In the middle lay the powerful cruisers *Scharnhorst* and *Gneisenau*, with colliers alongside busy coaling. Farther to the left the slender *Nürnberg*, also engaged in coaling. Scattered about in the harbor were a number of large and small tenders and auxiliaries of the squadron. The *Emden* was ordered to anchor in the right half of the harbor, close to the flagship. Rousing cheers were exchanged between ships as we passed the other vessels and soon thereafter our anchor splashed—the last time for a long while.

The captain reported aboard the flagship for orders from the squadron commander, and made the proposal to him to detach the *Emden* from the squadron and to send her to the Indian Ocean to carry on a cruise of "commerce destruction."

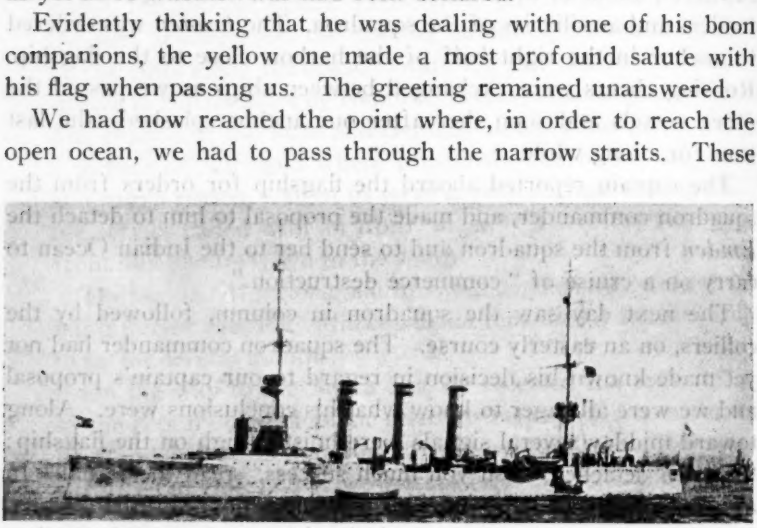
The next day saw the squadron in column, followed by the colliers, on an easterly course. The squadron commander had not yet made known his decision in regard to our captain's proposal and we were all eager to know what his conclusions were. Along toward midday several signals were hoisted high on the flagship: "*Emden* detached, wish you much success," read the signal. In an elegant turn our ship sheered out of column, a "thank-you" signal for the squadron commander's wishes at the mast head, then a semaphore to the *Markomannia*, "Remain with *Emden*," and soon, on an opposite course, we lost sight of the other ships of the squadron. All knew that we had seen each other for the last time.

It was a long trip to our particular scene of operations. It was tormenting not to have advices as to whether war existed with Japan or not. The German radio station at Yap had already been destroyed by the English. After cruising for a week we fell in with the German steamer *Princess Alice*. We took several reservists aboard and then sent her toward Manila. On the high seas we later on met our small gun-boat *Geier*. For lack of signal communication she did not have exact information of the war, nor any of that which concerned England and Japan. We remained together but a short time, exchanged such information as we had and the *Geier* then cruised to the eastward to follow the squadron. Our voyage again proceeded in the direction of our future hunting ground.

The days were right strenuous for the crew as we had to maintain war watches in order to be prepared for all emergencies. There was no opportunity to give the crew any recreation. We had no harbor in which we would be safe. A Japanese steamer, that we met en route, had to be left alone, unfortunately, as the ultimatum period had not expired, and as we had no information as yet as to whether war had been declared.

Evidently thinking that he was dealing with one of his boon companions, the yellow one made a most profound salute with his flag when passing us. The greeting remained unanswered.

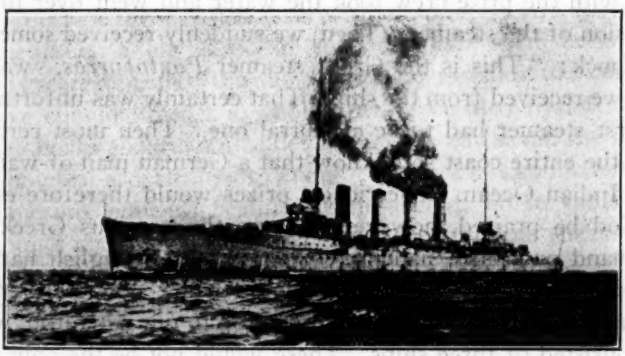
We had now reached the point where, in order to reach the open ocean, we had to pass through the narrow straits. These



THE "EMDEN"

straits swarmed with fishing craft and such other small ships. The nights being bright moonlight, the *Emden* was visible for a considerable distance. The captain did not relish the idea of meeting so many sailing vessels. He spoke to me about it, saying that he wished to avoid meeting any sort of ship for fear our presence and course in those waters would become known to everybody. All the English men-of-war had either two or four smokepipes; none had three like the *Emden*. Then I conceived the idea of building us a fourth smokepipe. Immediately I had all the deck-strips brought out. These are rolls of heavy sail cloth, about two meters wide, laid on the decks as a protection to the linoleum. In the upper end we sewed a wooden batten and then hoisted this improvised smokepipe forward of our regular forward smokepipe. As viewed from the side the effect was good. But from forward its appearance was exceedingly faulty; it did not have the neces-

sary thickness of its step-brothers. It was only a few millimeters thick. But in the hurry of that first night, nothing better could be accomplished. I proposed to the captain to build a better fourth smokepipe, to which he agreed. And the next day we began the work. Soon we had built, by means of wooden laths and sail cloth, an elegant smokepipe, and when this was in place we resembled the English cruiser *Yarmouth*. I purposely had the smokepipe made oval as the *Yarmouth* had one that shape. Our trailer *Markomannia* was ordered out to a position on our beam, and according to her suggestions (by signal) we improved the position of the fourth smokepipe. We then painted the marks to simulate overheating of the outer casting of the smokepipe,



THE "EMDEN" WITH THE ADDITIONAL SMOKESTACK

so that from now on we could, at any time, day or night, hoist our fake.

And so we arrived in the Bay of Bengal at the end of the first week in September. For about five days an English warship, probably the *Minotaur*, steamed parallel to and close by us, as we knew by the strength of her radio signals. By and by her signals became weaker until they ceased entirely. We did not sight her.

III. ON THE HUNT

Finally, during the night of September 10, our work began. A steamer came in sight and we approached her to have a closer look. Ship darkened, silently we stole up on our prey from aft. The captain approached to within a hundred meters of the steamer who, after the fashion of merchantmen, was peacefully going

ahead and bothering about nothing except what might be sighted ahead with lights showing. Through the quiet, calm night the megaphone broke forth with "Stop immediately! Do not use your radio! We are sending a boat aboard!" The steamer did not seem to thoroughly comprehend this. Perhaps she did not expect an enemy ship to appear here in the heart of the Indian Ocean, or did she possibly imagine it to be the voices of the sea gods that accosted her? In any event, she kept peacefully on. As a calling card we sent her a blank shot. Then she realized what was happening, went astern four bells and a jingle—we felt sorry for the poor machinists whom she so rudely awakened, blew her siren, and yelled her willingness to obey our orders. Our cutter with the prize crew took the water and went over to take possession of the steamer. Then we suddenly received somewhat of a shock: "This is the Greek steamer *Pontoporros,*" was the signal we received from the ship. That certainly was unfortunate. The first steamer had to be a neutral one. Then most certainly would the entire coast soon know that a German man-of-war was in the Indian Ocean. The richest prizes would therefore escape us. God be praised, however, because the precious Greek had contraband on board, namely, coal destined to English harbors. She was, therefore, the *Markomannia* being now half empty, welcomed as a most thankful contribution to our squadron, which now consisted of three ships. These would not be the only ones.

The *Pontoporros* had a cargo of Indian coal on board, the dirtiest coal that can be imagined. I had hoped to replenish our diminished stock of stores from the prizes. For six weeks the *Emden* had not been in port and could therefore obtain no supplies. The 1st Officer is the housewife of the ship and is responsible for every small detail in regard to the obtaining of supplies and equipment. Before leaving Tsingtao I had packed the ship as full as possible with everything that could be necessary or desirable. In the last few days, however, it became evident that we were rapidly approaching the end of our stock of soap. The portions that were issued to the men at first were now becoming much smaller. About 14 days more and we would reach the point where washing could be classed as a luxury. Therefore, I had jokingly told the captain to pick out a soap-boat for me as his first prize. Instead I drew a ship load of Indian coal. I could not refrain from tearing up to the captain, blood in my eye, to protest, but he

laughingly promised to do his level best to keep on the hunt to provide me with soap. And he kept his word. Very early in the morning of September 11, a few hours after our squadron had received its first addition, with the rising of the sun, a large steamer appeared dead ahead who, thinking we were an English man-of-war, was so overjoyed at our presence that she hoisted a huge British flag while still at a great distance. I do not know what kind of expression came over her captain's face when we hoisted our flag and invited him most graciously to tarry with us awhile. The steamer had left Calcutta and, having been detailed for transport duty between Colombo and France, was fitted out in fine style. Especially were we touched by the fact that she did not disown the English desire for cleanliness and therefore had taken such a big cargo of soap that our small crew, itself in the greatest need of this most necessary assistant to Kultur, would have enough to last a whole year. We also found a beautiful race horse aboard. A bullet behind the ear saved the animal the agonies of a death by drowning. We had less compassion for the numerous built-in, beautifully numbered, horse stalls and gun mounts aboard the ship. A half hour later the sharks could, at closer quarters, occupy their attention with these.

The crew of the ship was transported to our "lucky bag." The "lucky bag" was always one of the captured ships which was either empty or in ballast and therefore of little value, or which contained neutral cargo and could therefore not be sunk without a loss. At the end of the war, all neutral cargo destroyed must be paid for. The "lucky bag" always followed along behind the *Emden* until she was finally filled up with people taken from the captured vessels. Then she was detached and sent into the nearest harbor. Under these circumstances, the *Pontoporros* was detailed to the rôle of "lucky bag."

In the next few days our business expanded. It happened somewhat as follows:

When a steamer came up, it was stopped and an officer with about 10 men sent aboard. They prepared the ship for sinking and gave the necessary orders for the disembarkation of the passengers, etc. While we were so occupied, the next mast head would, according to rule, appear over the horizon. We had no need of hurrying. The steamers came willingly right up to us. When the next ship approached to the proper distance, the *Emden*

steamed ahead to meet her, made a friendly signal, which notified here to proceed close aboard our previously captured steamer. Then again an officer and some men would go aboard, prepare that steamer for sinking, give the necessary orders for disembarking the passengers, etc., and when this was concluded, the third mast head would bob up. The *Emden* approached her and the same process would be repeated. In this way we have had five or six steamers together at one spot. Of these, one would still show the tops of her smokepipes, the next would be sunk to the level of her decks, the third would be almost normal, but showing, by reason of her swaying back and forth, that she was beginning to go down. The passengers of our captured steamers would then make the most astonishing acquaintances aboard our "lucky bag."

So we grazed around in the region between Ceylon and Calcutta. With us were traveling our old follower the *Markomannia* and the Greek collier *Pontoporros,* which had meantime transferred her duties as "lucky bag" to the steamer *Cabinga.* This was an English steamer with an American cargo, that was not sunk because of the cost of the cargo.

The *Cabinga* accompanied us for several days. She, the *Markomannia,* and the *Pontoporros* were not the only *Emden* followers this night. During our journey we made some more prizes, but these, in the interest of the passengers, were not to be sunk until daylight, because of the seaway and the darkness. All told we had six followers that night. Of these, three disappeared under the surface of the sea the next morning. The *Cabinga* herself, with the passengers, was sent away. The captain's wife and small child were also aboard the *Cabinga.* The spot where the other steamers were sunk was so far from land that it was impossible for a boat to safely reach the coast. In anticipation of having his ship sunk, the captain of the *Cabinga* begged us to allow him, in case he be set adrift in a boat, to carry along a pistol with which to protect his wife and child. This was a typical example of the wrong impressions which the deceitful English press spreads among its countrymen. We would simply be following the tales of the English press if we, hundreds of miles from the coast, were to place women and children in open boats and allow them to starve.

When we told the captain that his ship would not be sunk he was beside himself with joy. I myself visited him aboard his ship for several hours. He could not properly express himself, begged

me to carry his thanks to our captain, and also gave me a letter with the request that I present it to the captain on my return. In this letter he again thanked us for the humane treatment which he and his family had received. The prize officer and crew who were aboard his ship had conducted themselves as gentlemen. He could not find sufficient words of praise for the behavior of the Germans. The captain himself would never forget the way he had been treated. He was received by his adversaries in much the same friendly and honorable way in which one seaman treats another seaman when in need in times of peace. He would do all he could to spread the truth in the English newspapers.

I had a long conversation with his wife. She said about the same things to me that her husband wrote in the letter. During the conversation she discovered that my oilskins were pretty badly in need of repair and she begged me most earnestly to take along the oilskins of her husband. Further, she entreated us, as we were hard up for smoking tobacco, to take as much tobacco and as many cigarettes as we could carry along with us. These were mere trifles with which they could show their appreciation.

Naturally, we left without taking oilskins or tobacco.

On leaving, the *Cabinga's* decks were loaded with people, all passengers of the captured steamers. And on our calling out to them, "You may proceed," the answer consisted in three cheers for the captain, the officers, and the crew of H. M. S. *Emden*, "Hurra! Hurra! Hurra!" All the people on the decks of the *Cabinga* joined in the cheering. How many there were can be best explained by quoting an English paper, which later on fell into our hands, in which was described the *Cabinga* on entering Calcutta as appearing not like a merchantman, but, from the number of persons to be found aboard, one could easily have imagined her to have been something like a school-ship. There were at least 400 people on board her.

Also, later on in our wanderings, whenever our "lucky bags," full of passengers from sunken ships, were detached, we always received our three hurras. It seems to be an English custom to reward the murdering of small children and the killing of women and men by giving three cheers.

I wish to insert here a few remarks concerning the actions of the English when their steamers were captured. Most of them were very sensible. As soon as they had recovered from their

first surprise, they would indulge in a series of complaints concerning their government, but, with one exception, never opposed the sinking of the ship. We always gave them plenty of time to gather up their private possessions. They usually devoted this time trying to save their valuable cargo of whiskey before the fishes could get at it. I can honestly say that we seldom delivered a crowd of sober Englishmen to the "lucky bag." After all, however, they never forgot their "business" and endeavored by every possible means to make the ships of the rival lines fall prey to the German privateering. Usually, when the captains left their ships, they would say: "Tell me, have you seen the steamer *X*?" We replied: "No!" "What," returned the captain, "haven't you seen her? Why she was steaming only two hours behind and seven miles south of me!"

By this means we always knew in advance the name of the next ship as soon as her mast heads appeared, and in this way avoided the embarrassment of meeting neutrals.

Especially pleased was one captain who found himself in the disagreeable position of having to pilot a dredger from England to Australia. Every seaman will sympathize with this poor devil for having to deliver to Australia such a wallowing tub, which could not make more than four knots. And so the captain was very much pleased at being captured by us, a fact easily understood by any unbiased person. Seldom have I witnessed such exulting pleasure in any man. It certainly was quite a trick to bring the rolling and pitching dredger this far. And tears of gratitude ran down his rough seaman's cheeks as he cried, "Thank God, I am rid of that tub! I certainly have long since earned that £500 which I was to receive for taking her to Australia."

A seaman always has a peculiar feeling when he sees a ship sinking. Even we, accustomed to helping vessels in distress, were affected not a little by the sight of sinking vessels, even those that we had to destroy. The destruction was usually done in the following way:

We went into the engine-room and removed the bonnet of a main overboard discharge valve. The water immediately came into the engine-room in a stream twice a man's height and more than a man's thickness. The watertight doors to the adjoining fire-room were opened and secured against closing, so that at least two large compartments of the ship would certainly fill up

with water. In addition, two smaller compartments were also filled, either by exploding bombs—this at night—or by firing shells into them. For a time the ship would totter about as if she did not know what to do with herself. Deeper and deeper she would sink until finally the rail would be awash. The waves would eagerly lap over the decks of the doomed vessel. It seemed as if unseen hands were pulling and tearing at her in order to seize their prey as soon as possible. A shudder seemed to run through her whole structure. This was possibly a shiver of fear of the ship's body, as if she were making a final heroic attempt to avoid her fate. Then came the surrender, the collapse. The bow sank, the masts came up flat on the water, the rudder and screws rose, the stern high in the air. The smokepipe blew out the last cloud of steam and soot. For a few seconds the vessel would remain standing vertically, and then, like a stone, shoot down into the depths. The air pressure would blow up the last few compartments or spaces in the stern. Columns of water, meters high, would be forced by the air pressure out of all openings, ventilators, and port holes. Then a swirling whirl, the sea closed over her, and nothing more remained to be seen of the ship. As a last greeting from the deep, about a half minute later, the loose spars, beams, boats, and such truck would come to the surface. The long planks of wood would shoot up vertically, like arrows, jumping several meters clear out of the water. The final marks of recognition of the spot where the ship sank consisted in a large oil slick, a few broken up boats, beams, life bouys, and such. Then the *Emden* would go ahead to meet the next oncoming mast head.

The English were extremely grateful for our allowing them sufficient time to save all their personal belongings. They also reported this in their newspapers. I am not stretching the point when I say that at the end of 1914, the *Emden* was the best-beloved ship in the East Indies. As a whole, the English had no understanding of this war. To them it is not a national war as it is with us; instead, they stand off indifferently and laud the achievements of friend and foe alike, solely from a sportive interest viewpoint. And so it happened that it was possible for the Indian newspapers to honor our captain and his ship in song and story. The captain was called "The Gentleman Captain," and the papers said "He played the game and was playing it well."

We treated those passengers well who behaved properly—which they nearly all did—and always met them at least halfway, and we did not hesitate to sacrifice ourselves in order to make them comfortable. That reminds me of a case when, shortly before sinking a ship, an Englishman came to me and asked that he might retain his sole treasure, that which was dearest to his heart, namely, his motorcycle. The motorcycle was taken out of the cargo space—a job that is not very easy—and was sent along with its owner, who was so touched that he could hardly speak, in a special steamer to our "lucky bag," where they both evidently felt happier.

Another Englishman had quite the contrary experience. He was a very superior sort of gentleman. He was "traffic master" of Calcutta, and was taking passage on a vessel bound for Colombo where he was to transfer the ship to the transport service. His plans were shot to pieces. This made him very peevish. In hunting for "trade" many otherwise approachable Englishmen become exceedingly sensitive. While the ship was being prepared for sinking, he packed his numerous patent-leather trunks and piled them up on deck. Then, with the superior air of one of the sons of the "Albion Rulers of the Sea," with his pipe in the corner of his mouth, his hands in the pockets of his large-checked trousers, he went up on the bridge and promenaded back and forth. His contemptuous glances were cast at the "Germans." He bothered no more about his trunks. He assumed that, at the proper time, we would come to him for orders in regard to the disposition of the trunks. Finally all the other people with their impedimenta had left the ship. The ship was ready to be sunk. In single solitary grandeur the "traffic master," checked trousers, pipe stump and all, still promenaded the bridge. He was told that it was now time for him to leave. His answer was merely a mute indication with the thumb of his right hand, which he removed from his trousers pockets for this special occasion, toward his pile of trunks that, by its glittering isolation, still graced the deck of the ship. Evidently he concluded that his regal attitude was sufficient to make us especially attentive toward the looking-after of those trunks of his—"The Traffic Master of Calcutta." Our men no doubt misunderstood him. They quietly concluded that he did not care what became of his trunks. These, after this experience, went overboard all alone. The same would have happened to him had he not speedily left the ship. The last boat was about to leave. The

"traffic master" then descended, first from the heights of his English dignity, then from the heights of the bridge, quickly grabbed up the smallest box that remained and hurriedly carried it off the ship. Our men accompanied him, hands in their trousers pockets, cigarettes in the corners of their mouths.

All of our original supplies had naturally long since become exhausted. But, thanks to the thoughtfulness of the English, the captured steamers were so well supplied with conserved provisions by the best English firms that our men had to exercise the greatest self-restraint in order to carry out our mission—*i. e.*, enemy goods must under all circumstances be destroyed. Especially did we prove that candy and confectionery and such other tasty bits, because of their cognac contents, were not unsuitable even to sailormen's palates.

In the neighborhood of Calcutta we made the little-to-be-desired acquaintance of a steamer by the name of *Loredano*. Though she failed to hoist a flag, she could readily be identified as an Italian from a distance, because she was literally incrusted with filth of all sorts. Not finding anything suspicious when examining her, we had to permit this neutral vessel to proceed. This happened just at a time when we had gathered in another batch of ships and were commencing to send them on their downward journey. After sinking the last ship, and as the *Emden* was leaving the spot, we could still see the Italian busily engaged in fishing up the floating bales of tea that came from a large tea ship we had just sunk. Did he perhaps think these bales contained macaroni? We did not begrudge him this pleasure. But we were less pleased the next day to find out that this "neutral steamer" had made herself guilty of interfering with the rights of a commerce destroyer during war, by sending a radio notifying the entire region that the *Emden* was at hand.

As we had grazed about sufficiently in this region of the Bay of Bengal, and as we noticed that no more ships were arriving, we decided to shift our scene of operations, which was becoming more alluring each day, to the other side of the Bay, near Rangoon. And here we received our first serious set-back in that not a single ship was running. Later on we read in the newspapers that the entire shipping was held up because of our presence. For all that we had to consider it a moral success that a Norwegian steamer had taken over the duties as "lucky bag" and that we

were now free of our last troublesome guests. During our trip to Rangoon, we were not sighted for more than a week. This fact caused the circumspect English Indian Government, in the interests of its subjects and to officially announce the celebration to their patient countrymen, to spread the report that the *Emden* pest had now been successfully exterminated by her 16 pursuers, and that now the ocean trade could again be safely carried on. Of course we did not know this until later when we read of it in the newspapers. As merchantmen no longer appeared in our locality, we returned to the region of our former operations on the east coast of India. The captain decided to test the resistance of the oil tanks at Madras. The *Emden* appeared off the harbor on the evening of September 18. There, the very day before, had the official announcement of the *Emden's* loss been made. In order to properly celebrate, a hilarious crowd had assembled that night in the club. As we did not know this at that time, we unfortunately were not responsible that our shells dropped into the soup of the diners. Otherwise we would naturally have postponed our bombardment for one day. One should never unnecessarily irritate one's foe. Holy institutions must be treated with as much clemency as possible. And especially in regard to his "dinner" is the Englishman sensitive.

We approached to within about 3000 meters of Madras. The lighthouse threw its friendly beams out over the harbor. It made our navigation quite simple, for which we gave our unanimous thanks to the high government of this place. In the searchlight beam we saw our object, the high, white, red-topped oil tanks. A few shells thrown into them, several pillars of bluish-yellow jets of flame, a red, burning stream running out of one of the shot holes, an immense, heavy, black cloud, and, in accordance with the old proverb, "A change makes for contentment," we had this time sent several millions into the air instead of into the sea.

On leaving Madras we were fired on without knowing from what direction the shells came. But there were only a few shots fired and these evidently without aiming. Later on the English wrote in their newspapers that, when we were fired on, we doused our lights and quickly disappeared. To this I would remark that we of course first approached without any lights showing, and that both the captain and I did not notice that we were being fired on, of which we were later informed by our officers stationed aft. There-

fore, we had no idea of withdrawing because of the firing. In regard to the lights, we did exactly the opposite. When we finished firing we lighted up the ship, that is, we purposely displayed many lights on our port side and headed north. Soon thereafter we again put out all lights and headed toward the south.

The fire at Madras lighted our way for a long time. The heavy, black smoke cloud of the burning oil was still visible the next day, even though we were over 90 sea-miles, that is, about 180 kilometers, away from Madras. By way of Pondicherry we kept on around Ceylon in order to honor the west coast of India with our presence.

As we later read in the newspapers, our bombardment of Madras resulted in the flight of all Europeans from the coast to the inland regions. In addition, the English established " searchlight service," that is, they played searchlights every night along the entire coast adjacent to their harbors. In this way they simplified our navigation very much, for which we again give our unanimous thanks to the far-sighted Indian Government of this section. On the evening of September 26, we were close to the harbor of Colombo. While cruising back and forth we suddenly saw a dark shadow in the searchlight beams which interested us very much. At a distance she seemed rather dangerous, but this danger lessened on her closer approach. It was an English steamer loaded to the eyes with sugar. The captain of this ship, which we captured under the very guns of the English forts, because he was sighted in the beams of the searchlights of his own war harbor, was so peeved that he objected to our orders. The deplorable result of this patriotic step on his part was that he was not allowed to take even a handkerchief along with him when he left his ship.

Within five minutes his ship was cleared and the crew transported to our " lucky bag." The captain and his engineer divided the honors of being permitted to inhabit one of the temporary cells aboard H. M. S. *Emden*. Ten minutes later the sugar steamer sweetened the suppers of the sharks.

This English captain, as we later found out in the newspapers, told some wonderful fairy tales about the *Emden*. He set forth that he was well treated, but when brought aboard the *Emden* he did not receive treatment according to his rank. Evidently he had an idea that our captain should vacate his cabin for him. Further, he spoke rather disapprovingly of the cleanliness of the *Emden*.

She was said to be dirty, scarred, and dented, in which I cannot disagree with him. It is impossible to coal for weeks at a time in the open sea, or to carry a heavy, loose deck-load of coal, without being scarred. Had I had any idea that I would receive such a pleasant visit, I should have staked my reputation as a 1st Officer on my being able to show my guest a cleanly scrubbed and freshly painted ship.

In addition, this precious man said that our crew looked starved out and in low spirits. If our men appeared to be starved out it would mean that we failed to use the provisions which we found on the captured English ships, letting them go to waste instead. And the low spirits of the crew can best be illustrated by the fact that they knew of no greater enjoyment than to perform the best dancing steps before our guests during the daily after-dinner concert to the tunes of "I was at Shöneberg, in the month of May," or "Carousing and Drinking." Later on, perhaps, when our unwilling guest left the *Emden* in order to travel home aboard our next "lucky bag," he probably did not fare so well. Our prize officer, who remained aboard the "lucky bag" until she was detached, told us that the ship's officers of the sugar steamer cursed their captain out roundly. He himself was said to have been sufficiently insured against losses, but they were not. And through his obstinacy they had lost all their own possessions. As the captain came aboard the "lucky bag," his officers met him at the gangway with shirt sleeves rolled up. Perhaps he often wished that he had remained aboard the *Emden*.

In the meantime the question of coal supply was getting troublesome. Our faithful *Markomannia* was empty. We still had with us the other prize, *Pontoporros*, which was filled with Indian coal. The Indian coal, however, makes very heavy smoke clouds and deposits a great amount of soot in the boilers, so that our followers were not very pleased with our smoking them up. The question of better coal was decided, however, by the English Admiralty in a very useful and anticipatory manner; for, the very next day they sent us a fine 7000-ton steamer, full of the best English-Welsh coal, bound for Hong-Kong, but diverted for uses other than their own. With this we were well supplied with the best coal and our cares for a further supply of that commodity were put off for some future day. The captain of our latest collier did not hesitate to accept duty in the German service, and whis-

tling "Rule Britannia," he thenceforth conducted himself aboard ship in a fair and honorable manner, the operation of the collier of course being supervised by one of our officers and a prize crew.

Meantime it became clear to even the English Government that the *Emden* had not as yet been wholly destroyed. Therefore, they again gave more orders to stop all trade. There was nothing for us to gain by remaining in that neighborhood. The captain, therefore, decided that during this pause we would devote some attention to the *Emden*, which had been at sea for such a long time. It was especially necessary to scrape the long grass off the ship's bottom. And so we started south.

IV. The Flying Dutchman

We knew that 16 enemy vessels, consisting of English, French, Russian, and Japanese were on our trail. Information in regard to their positions or their names was denied us. But it made little difference, as the *Emden* was the smallest and least powerful of the cruisers in the Eastern Asiatic. Any opponent whom we might meet would be more powerful. It was clear to everybody on board that the *Emden* could not continue her rôle much longer. Sufficient hounds will surely kill the rabbit. Even in case of meeting an enemy cruiser that was not much too powerful for us, we must still suffer such damage and such a large loss in personnel in the fight, that we would have to leave our scene of operations. There was not a single harbor where we could go for repairs. Above all, it would be impossible to replace the losses in personnel. The captain had taken this view at the beginning of our operations and therefore decided that it was the *Emden's* duty to inflict as much damage as possible before she, sooner or later, came to grief.

We knew by means of the radio signals that our enemies were all around us, and often close by. Although we could not decipher the messages, which were in secret codes, still we could estimate by the strength of the signals how far away the sending ship was. However, we did not derive much advantage from this as our enemies were frequently on all sides of us. Instead of slipping by them we might possibly run right into them. The English have frequently said that the *Emden* eluded them so long because of her high speed. That is not correct. Even apart from the fact

that her bottom had grown so foul as to make high speed impossible, the *Emden* still could not make more than 11 knots. The colliers, that were not any faster than that, had to be convoyed. Again, there was no need of higher speed. When going at 11 knots we might miss an enemy, while at 20 knots we might have walked right into the same enemy's arms. The radio messages received gave us a hint, luckily, as to which nation the ship belonged. The English sent differently than the French, and these differed from the Japanese, and these again sent differently than the Russians, because the last mentioned, when they could signal at all, did so very poorly.

The routine aboard was practically the same as during peace. Of course we had several more lookouts on watch at night. Naturally all guns and torpedoes were kept ready for action day and night.

The captain spent the greater part of his time on the bridge. There, in out-of-the-way corners, we placed comfortable chairs, so that he could sleep up there and still be constantly at hand, ready for a call whenever the occasion demanded it. During the day he busied himself looking over charts, sailing directions and such other sources of information. After hours of tedious work, he would draw up his plans, which the *Emden* was to follow so successfully. The devotion of the crew to the captain was touching. The men knew exactly what kind of leader they had and were proud of their ship which he so successfully commanded. Singing and other noises ceased very quickly when the word was passed, "The captain is tired." A single word of encouragement from the captain to the men, whether during a maneuver or when coaling ship, in spite of the heaviest work or the greatest exhaustion, brought the most astonishing results. Often enough, while going through the ship at night, have I heard the men sitting in the dark discussing the captain. "Yes, our captain, he knows how to do it." That was approximately the gist of their remarks.

Life in the officers' mess was also practically the same as in peace times. The mess rooms were not quite as comfortable. All woodwork was removed; curtains and other inflammable material were taken down. Transporting ammunition and such took place through the mess rooms day and night. The gun mounted in the ward room, had to be kept ready at all times. At night, all officers not on watch or at their battle stations, slept, during good weather,

in hammocks on the poop, and during bad weather on mattresses and in hammocks in the mess rooms. Undressing was not customary. One had to be ready at all times.

The most pleasant hours were those spent reading the newspapers captured on the ships. That was our only connection with the whole outside world. Whenever it happened that we were mentioned in the English press, we could construct a fair estimate of the accuracy of their lying reports, especially if one had had previous experience with the Reuter Information Bureau. It was very comforting to us to follow our "disorderly retreat" out of France in the western campaign! Also we did not permit ourselves to be seriously disturbed over the enormous losses of German troops, even though when these were added together they considerably exceeded the total population of the entire German Empire.

Our own deeds were likewise reviewed in the English light through their Indian newspapers, and we were somewhat astounded to see how the English took it. They seemed to think the whole thing a huge joke, made comic remarks about their own numerous ships that could not catch us, joked about the shooting-up of the Madras oil reservoirs, nominated our captain as an honorary member of their best club in Calcutta, and published a long series of *Emden* stories. These were so untruthful that one need only set them forth as base counterfeits of a race as irresponsible as the English. A few of them are recounted.

In one of the Indian papers appeared an account of a merchant captain who said he had met the *Emden* without being captured. The mere fact, that this story was believed, definitely proves the gullibility of the English reading public. Because any English steamer captain that ever met the *Emden* never again left her with his ship. The captain went on to say, "I steered for Sand Head light-ship at night, but found it out of its accustomed position; but soon thereafter I saw the pilot boat which turned its searchlight on me. (For the reader's benefit, I will add that it is usually customary in that locality to equip pilot boats with searchlights in order to draw ships toward them.) I proceeded with my steamer toward the pilot ship, but was astonished to find that I was not getting any closer to her; instead of the pilot ship coming closer to me she was running away. I ordered my engineer to raise all steam possible and to work up to full power. In spite of this the

distance remained the same. Over this unusual maneuver of the pilot, I cudgeled my brains. Before I had arrived at a conclusion my astonishment rose to hitherto unmeasured heights when I saw the pilot boat commence to make small and then ever increasingly large circles. I went astern in a wild attempt to cut off a chord of his circle and thereby get nearer to him. My signal with the steam whistle accomplished nothing. Neither was I able to reach the pilot boat. After I had gone astern like mad for about a half hour, the pilot boat extinguished her searchlight and left me in total ignorance. I later on learned that this pilot boat was the *Emden.*"

So much for the tale of this captain. Ingenuous angel!

Another *Emden* yarn came out in the Calcutta paper in which was stated:

One day the government received an urgent radio message that said an English cruiser, coming from Singapore, had burned up all her coal in chasing the *Emden* and now was slowly heading toward an Indian port, burning chests, beds, furniture, etc. It was urgently requested that several thousand tons of coal be hurried to this port. The efficient and zealous government immediately took special steps to pass the order along to some subordinates to carry out. These subordinates, also wishing to do something for the good of their fatherland, passed the order along to some other subordinates. These again, filled to the brim with zealous energy, and also wishing to do something, finally decided to turn the now voluminous correspondence and orders over to a coal firm. These last, seeing an opportunity to make some money, finally actually set to work. Hundreds and hundreds of coolies were employed, mountains of coal were quickly loaded into the trains, day and night the work continued feverishly and uninterruptedly. Shortly thereafter, train after train, filled with steeple-high loads of black diamonds, began to roll into the harbor at the hitherto unheard-of speed of 40 kilometers per hour. In the meantime extensive preparations were going on in the harbor in order to expedite the coaling of the English warship. No precious time must be lost in capturing the *Emden.*

Most astonished—which was rather pleasing in the case of the coolies, but less pleasant in the case of the others concerned—were the railroad officials, the captain of the port, and the inhabitants of the city, and especially displeasing in the case of the

wounded feelings of the coal firm and the government, when finally no English cruiser appeared. Eventually some light was thrown on this dark affair. After much thinking the Indian Government finally found the solution. "*The Radio was sent by the Emden.*" The government did not tell its readers how the *Emden* could possibly have sent this message in cipher without having a copy of their secret code.

In this way many so-called "*Emden* stories" were published. On board we composed a theatrical skit on all these yarns, but unfortunately it was lost later on.

The crew had a great deal of spare time. It was impracticable to carry on drills as in times of peace. A considerable portion of the crew was always busy either on watch on deck or in the engineer's department. The remainder had to be constantly kept in first class physical condition to provide against any possible unknown contingencies of war. During good weather the majority of the crew slept on their battle stations at the guns. The engineer's personnel especially had to be provided with good airy places to sleep. The extraordinary intense heat made it impossible for them to sleep in their allotted quarters. Therefore, we set aside for them a certain place on deck and made preparations for swinging their hammocks there. So it happened that during fair weather at night on deck a regular "sleeping army" swung lightly back and forth in their hammocks.

Frequently we issued reports of the war or as much as we might know of them. The newspapers were read to them and the private books of the officers were loaned to the men up forward to give them some diversion.

The duty of publishing the war bulletins to the men I reserved for myself. We made a large chart of Germany and the surrounding countries, and on this we traced the lines of land conquest.

It was not an easy matter for me to come to a conclusion as to the best way in which to impart the war news to the men. We were entirely dependent on English newspapers which printed, as I knew, the most unreasonable and distorted reports. Constant defeat of armies, perfect disintegration all around, complete collapse, famines, revolutions, suicide epidemics among army leaders, were the order of the day. The Crown Prince was killed, the Kaiser had been wounded, Bavaria had seceded from the Empire, and such idiotic nonsense.

I might have made up a résumé of the newspaper reports and published this to the crew, omitting the crudest of the English falsehoods. It was very possible that the morale of the men would suffer if they continued to hear these constantly depressing reports from home. On the other hand, I had to admit to myself that the contents of the papers could not forever remain unknown to the crew. My mess-boy would probably see and read the newspapers in my room. The mess attendants were present in the mess room when the officers read and discussed the papers. In case of a great difference between my published reports and the tales brought forward by the mess attendants the men would conclude that I was purposely holding back something and that conditions in Germany were even worse than I stated them to be. And that, above all things, had to be avoided. So I told the crew that I would read the newspapers to them, word for word, reserving my comments until later on.

In order to characterize the business of Reuter's Bureau *in puncto* love of the truth, I found that their telegram, which we picked up in early August in the China Sea came in very handily. It said: "Official, *Emden* sunk in battle with *Askold*!"

Among none of my men could there exist the slightest uncertainty that this was a wild exaggeration, and I could always point to this telegram when estimating the truth of the other similar reports.

The men quickly learned the proper value to be placed on English reports.

Much pleasure was caused by a chart of Germany, on which the English had already "divided the skins of the bears." On this chart, France reached to Weser-Werra and to the Bavarian boundary, Denmark to the line of Wismar, Wittenberg, Magdeburg, Hanover, Bremen. England had swallowed up Oldenburg and Hanover. East of the Elbe, including Saxony, was, in the future, to be a part of the Empire of the Little Father. Bavaria remained an independent state. Of the German Empire there remained but one small spot called "Thüringen."

As soon as this was known, our men from Bavaria and Thüringen carried their heads especially high. In the first place, because they were regarded as important even to foreigners, and in the second place, because they believed themselves to be the pivots of the whole Empire.

How we did laugh about this!

The men took great pleasure in the daily hour in which they were read to. As soon as we had captured a steamer, and a bundle of newspapers arrived aboard, then in the next few hours all eyes seemed to say: "When will the reading commence?" Then followed the arguments among themselves as to who should stand watch, as no one wished to miss the reading. And, when the word was passed, "All hands aft," a yell of delight spread over the ship from the bow to the stern.

When the newspapers were being read, and though possibly the war reports were not very startling, still an energetic questioning always followed. Especially did they want to know about the ships of the squadron.

The battle of Santa Marie (Coronel), where for the first time in over a hundred years, an English squadron was defeated by an enemy of the same strength, naturally aroused the greatest enthusiasm. Everyone knew that the fate of the remaining ships of the squadron was as effectually sealed as was our own fate. Therefore, the happiness and pride was especially great to know that our armored cruisers had won the first German victory and had humbled an English squadron for the first time in over a hundred years.

Our work consisted mainly in making necessary repairs to the hull, machinery, and armament. In order to keep the crew fresh and clean, we rigged up a number of showers on deck, made out of old piping. Three times daily the entire crew was ordered to the showers, where each man could remain as long as he pleased.

The health of the men aboard the *Emden* was excellent. From the time we left Tsingtao until the final battle, we had not one single case of sickness. In the afternoons the ship's band played for quite a long time. The men sat around comfortably on the deck, forming a circle around the band, some dancing, smoking, or joining in with song. Usually in the evenings after dark, a glee club of good and strong singers would gather and render all the "possible" and "impossible" songs.

The "possible" songs were usually our beautiful German national songs, which were rendered excellently. The "impossible" songs were often composed as the singer went along. These usually consisted in trying to bring out clearly some idea or other; but rhyme and rhythm were neglected. The concluding air was always "The Watch on the Rhine," in which all hands who happened to be on deck always joined.

An unusual celebration always accompanied the business of "dividing the loot." From the captured steamers we took, always justly, everything that could be used aboard the *Emden,* especially edibles. And so a high mountain of provisions always piled up in its designated place on the quarterdeck. Sausages and hams hung suspended from the engine-room skylight. Mountains of chocolate and confections, bottles marked "Claret" and "Cognac," with three stars, ornamented the waterways. Live-stock was placed in its proper pen, accompanied by much grunting, squeaking, bleating, cackling, or quacking. The steward and his men made up a list. When all was ready the business of dividing was begun. The men, standing around in a large circle, smoking and chattering, had to spend a good deal of time in storing the allotted tasty-bits up forward after the dividing had finished.

In order to keep pace with the constant supply of provisions special meals were served. Chocolate or bonbons were served with coffee. Over 250,000 cigarettes were consumed by the smokers, and each evening, after the issue of "smokes," the deck seemed to be alive with hundreds of fire-flies. English flour, of which we received great quantities, gave the bakers all sorts of work. Excellent bread was made. Because of the bountiful supply of food stuffs, it became necessary for the officers to pay especial attention in guarding against overfeeding, instead of underfeeding.

It is unnecessary to state that we also brought aboard useful supplies of a nature other than provisions. Whenever I betook myself aboard a captured steamer I always carried along a request-list. Seldom did it happen that the requests were not filled. Even when the men requested such unusual things as soldering lamps, piassava brooms, rubber discs, file handles, dark lanterns, iron bars, fire-bricks, machine oil, etc. The men whom I took along over with me to bring back the stuff knew best what the men aboard ship wanted of those things which were at hand and not on the request-list. But among these I could not grant all the requests. I had to refuse permission to take aboard such articles as oil paintings, large mirrors, children's drums, live horses, etc.

At times when we thanked our stars for these things we could not but feel very sorry for our pursuers whom we knew to be close to us, and yet of whom we could say that they had had to live on hardtack and corned beef for weeks at a time, and that to

them such things as beer, wine, cognac, fresh eggs, fried chicken, juicy ham, chocolate, bonbons, and cigarettes, must be "Fata Morgana" in their deluded dreams of their last port.

And so we passed our lives while the certain death's ring surrounded us, 16 cruisers uselessly burning their coals, and fruitlessly cudgeling their brains, in trying to catch us. As previously mentioned, when the enemy trade ceased and the captain decided to lay the *Emden* up for a short time, especially in order to clean her bottom, we steamed to the southward out of the Bay of Bengal region, until one fine day our anchor was dropped into the mud for the first time in a long, long while. We lay in the harbor of Diego Garcia. This is a small English island well down in the southern part of the Indian Ocean.

We had hardly anchored when the English flag was hoisted ashore. A boat containing an old Englishman approached us. Cheered by the sight of another human being, the old man came aboard with gifts of fish, eggs, vegetables, etc. He said he was much pleased to again for the first time in many years, greet his dear, beloved German brothers. He always loved to associate with Germans, especially aboard their wonderful warships. The last time he had done this was in 1889 when the German frigates *Bismarck* and *Marie* were in the harbor. And so he was now particularly pleased to see us, hoping that soon hereafter another German ship would anchor in Diego Garcia.

At first we were rather astonished at his greeting, even though we had previously experienced many peculiarities of the English. But soon we drew from him the fact that Diego Garcia receives mail but twice a year from Mauretius. Therefore, these people had not yet heard of the war. We did not have the heart to throw a scare into these folks, so we did not tell them. Why should we? Perhaps we would again visit there! When our guest arrived on deck, instead of seeing the usual beautiful snow-white decks of a German man-of-war, he saw a mess covered with oil stains and coal dust and with bare and scratched spots; and when he saw that our engine-room skylights were more of a black than a gray, that the rail was broken and torn away in many places, that only a few isolated patches of linoleum remained, that plaited matting (cargo nets) was hung around the guns as a splinter protection, that many spots on the bulkhead showed, where formerly something had been secured against them, and when he noticed that we had

no more furniture in our mess room, his face took on a look of astonishment as he asked why all this was. We quieted him. We were in the middle of a world cruise. One had to leave such things behind and use every nook and cranny for coal storage. As for the rest, we gave him so much whiskey to drink that he gave up thinking. That, however, was not a hard thing for him to do. Laboriously he managed to make one request; would we please take the knocks out of his old, excessively vibrating motor-boat which had been there for the last six months? We promised him and fulfilled the promise.

The stay in the harbor was utilized in putting the ship in good condition, in cleaning and painting her and in scraping her bottom. The last could only be done in a very incomplete way and was done by flooding some compartments on one side, thus listing the ship. The opposite side, with part of her bottom exposed, was then scraped, the men working alongside in boats.

The stay in the harbor also gave us some hunting. Two objects which were seen floating in the water around the ship were taken for balls of old, dirty clothes thrown overboard from the ship, until suddenly these objects began to move and the lower edge appeared to be a light, shimmering silver. On closer approach they were discovered to be enormous rays (skates). I estimated them to be four to five square meters. They had large, wide, pale-colored mouths and were chasing smaller fish. Rifles were quickly brought on deck and we shot these animals. To do this one had to wait for the proper moment, when it happened to lift its flat back slightly out of the water. One lucky shot struck one of the animals in the back. He sprang up with a loud noise in a roll about 20 to 30 centimeters high, thrashing about madly with his broad flappers, so that he looked like a large bird in its death struggle.

Unfortunately we were unable to secure the beast.

Of course, the ship not being underway, much time was spent in fishing. All over the ship and out of all air ports hung the fishing lines and a rich catch was made in the harbor. The most curious forms were caught. All the colors were represented. Red, green, and blue fish of broad or narrow forms, with eyes above and eyes below, with or without scales. Every possible kind was brought aboard. The doctor inspected all the fish before they were eaten in order to keep from eating any of the poisonous varieties.

There were also some snakes. Unfortunately none were caught. They were about two meters long and of a pale green appearance. They would jump up out of the water and then swish their tails back and forth very rapidly, keeping their bodies almost vertical, and propel themselves along above the surface of the water at great speed.

This idyl unfortunately could last but a short time. Soon the *Emden* got underway, bound to perform new deeds. The region near the island of Minokoi yielded many more prizes.

In the meantime the regular steamer trade had started up again. We were especially touched by having the English Admiralty send us another fine, 7000-ton steamer laden with the best English-Welsh coal. But soon thereafter no more steamers came near Minokoi. Either the trade had ceased again or the ships were taking a different course. We were able to solve this later on.

Next, we took up the search to the northward of Minokoi. And see, after a short time, we fell in with an English steamer whose captain could say nothing except to ask this astonishing question: "Tell me, please, how did you find out the new secret courses prescribed by the Admiralty for merchant vessels?" That was the sign for us to expect more to pass this way. And so it did happen. In this way we made for the second time, the acquaintance of an English woman. The first thing that struck me was the way she took her fate. She amiably prattled around on deck giving cigarettes and chocolates to the men. According to her story it was evident that this interruption of her travels by the *Emden* was nothing new to her. First, while sailing from Hong Kong for Europe, her ship was turned back in the China Sea and she had to waste several weeks in Hong Kong because it was said that the *Emden* was about. Then she managed to get to Singapore and expected to start out again from there. Here again, while in the outer harbor, her ship was called back because the *Emden* was there. After several more wasted weeks of waiting she went from Singapore to Colombo, and on the outward journey from Colombo, she really did make our acquaintance. She returned to India on our "lucky bag."

Capturing a steamer at night was not an easy matter for the *Emden*, and, at the same time, rather strenuous on the crew. We never knew whether the approaching vessel was a warship or not.

Unless, beyond the shadow of a doubt, it was definitely known that we were dealing with a merchantman, we had to call the crew to their battle stations. Also we had to reckon on the possibility of the English having warships convoying their merchantmen. The man-of-war would then steam along a short distance behind the merchantman, and, while the *Emden* was devoting her attention to the steamer, the warship would suddenly and unexpectedly attack us.

One time we thought we were confronted by a warship. It was a dark night. A steamer, lights burning, came toward us. Evidently a merchantman. We, totally darkened of course, approached her from dead ahead. Just as we were about to turn on her, we saw behind her a dark body. It might have been a darkened warship. We could not tell what it was. Therefore we started to attack.

"Both engines full speed ahead. Torpedo-tubes ready! At him!"

On near approach we had, it must be admitted, directed our attack at a smoke cloud which, by chance, the steamer had made at this place and which, due to the dead calm, had hung close to the water.

Unfortunately, we did not escape from often meeting neutral ships in this neighborhood. After an examination we had to let them go again. All of these were Hollanders.

We were very pleased that the Hollanders behaved themselves better than the *Loredano* did on a previous occasion. We never intercepted a radio from a Hollander in which the *Emden* was mentioned. At another time we proved that the Dutchmen, in order to observe strict neutrality, forbade their vessels sending out miscellaneous war news by radio. We caught one radio in which an English ship requested a Dutch ship to signal her the reports from the war. The answer said: "We are not allowed to radio war news."

And so did the *Emden* cruise about in a very small part of the ocean, chased by 16 more-powerful pursuers, and all the time naturally confined to the regular steamer tracks. Because there, and there only, could prizes be expected.

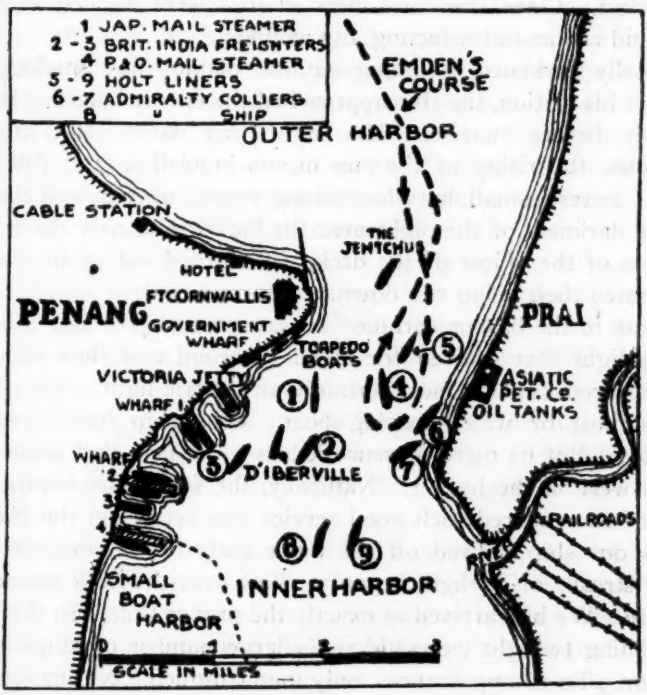
Because of the inability of the enemy to catch us and because the *Emden* struck like lightning, bobbing up here and then there,

the English-Indian newspapers published a yarn that there were several German ships about, and they all bore the same name.

Soon we were no longer called the *Emden,* but "The Flying Dutchman."

V. Fire Baptized

Merchantmen again failed to come, and as the *Emden* had just finished overhauling, we had to plan something else to fill in the



THE "EMDEN'S" RAID IN PENANG HARBOR

present pause. After much reflection, the captain decided that our enemies from Colombo and Singapore must have a rendezvous where they could coal, provision, and rest their men. The most likely advance base seemed to be the harbor of Penang. According to the press reports we concluded that the French armored cruisers *Montcalm* and *Dupleix,* especially, would frequent this place. These or any other ships, would, said the captain, be attacked in their own harbor.

The night of October 27-28 found the *Emden* before Penang, heading in toward the harbor at high speed. The captain wished

to enter with the first gray streaks of daylight. Navigating the narrow harbor entrance by night is too dangerous. Also, early morning seems to be the time of soundest sleep, and a surprise attack at that hour promised the best hope of success. At the proper time, all hands on the *Emden* were aroused. The ship was absolutely "cleared for action," that means, she was made ready in all respects for a battle. The men were served a good warm breakfast. Clean linen and clean clothes were donned in order to avoid chances of infecting any wounds.

Totally darkened, steaming without making any smoke, each man at his station, the ship approached the enemy harbor. It was shortly before sunrise. The night was dark. But, in low latitudes, the rising of the sun means immediate and full daylight. Several small, harmless fishing vessels were passed close-to in the darkness of the night near the harbor and only the watchfulness of the officer of the deck, who turned out of his course, prevented their being run down.

Close to the harbor entrance we saw on our port side a bright white light that showed for about a second and then suddenly disappeared. It was most certainly an electric light, evidently on an outpost or watch-keeping boat. The ship itself was not sighted. But its mere presence led us to suspect that some warships were in the harbor. Naturally, the fourth smokepipe that had often rendered such good service was set up on the *Emden*.

As our ship arrived off the inner reefs of Penang, the first faint streaks of daylight began to show over the dark mountains ashore. We had arrived at exactly the proper time. In the short prevailing twilight we could see a large number of ships in the harbor. To all appearances, only merchantmen. No matter how hard we strained our eyes we could see nothing that resembled a man-of-war. We had already begun to think that we had made a failure of it, when suddenly, in the middle of the undarkened merchant ships, we saw something that was both dark and darkened. All eyes for a man-of-war. After a few minutes we were close enough aboard to make certain that it was some sort of warship. Soon we saw three white lights, equal distances apart, in the midst of the darkened, black mass. Our first thoughts were: these are the stern lights of three destroyers moored alongside each other. Soon we discovered, however, that this assumption was not correct. The ship's hull, now coming into plain sight, was

much too large for a destroyer. The enemy ship was swinging to the tide with her stern toward us, so that unfortunately she did not make a silhouette. Not until the *Emden* had passed within about 200 meters from her stern, the enemy being abeam of us, could we definitely identify the vessel as the *Zemtchug*. Peace and quiet reigned on her. We had arrived so close aboard that we could distinctly recognize the Russian cruiser in the early gray of morning. We could not see the officer of the deck, nor the lookouts, nor even a signal watch. At a distance of 200 meters our first torpedo flew out of the starboard broadside tube, and at the same time our broadside guns opened up into the forecastle of the *Zemtchug* where the crew was asleep. The torpedo hit the enemy cruiser in the stern. One could plainly see the tremor that ran through the ship when she was struck. The stern was lifted about a quarter to a half meter out of the water and then the ship immediately began to settle slowly by the stern. The Russians now began showing signs of life. The doors, leading from the officers' rooms on deck, were torn from their hinges. Many officers came running but seemed to know their way to their battle stations very imperfectly. Without tarrying very long to consider, they hurried aft to the flagstaff and hopped overboard. A long row of sailors followed suit. Evidently these were their servant-boys, who follow their masters through thick and thin.

In the meantime our guns carried on a rapid fire, at point blank range, into the *Zemtchug*. The *Emden* steamed past the enemy cruiser at very slow speed at a distance of 400 meters. The broadsides continued raining shells into her. The fore part of the ship was riddled in a few minutes. A fierce fire was eating up the forecastle. One could look clear through the ship through the large holes in her sides. One after another the projectiles kept on hitting. When they hit you could see a sharp, pale flash. Then, after a few seconds, as if flaming hoops were whirling around the spot where it hit, it reached the inside of the ship and then exploded, shooting the smoke out through the holes in the side meters in size. I did not see a single man escape from the forward part of the *Zemtchug*.

Meantime the *Emden* was being fired on from three sides. Where the shells came from we did not know. We merely heard the whistling of the shells and then saw them strike the merchant-

men that lay all around us. Even the *Zemtchug* woke up and opened fire. As her guns were larger than ours, a hit on us could have resulted disastrously. Even though the *Emden* might not be put out of the fight, still she could receive such damage that, not having a means of making repairs, her activities would have been considerably curtailed. The captain, therefore, ordered a second torpedo to be fired.

The *Emden* having passed the *Zemtchug*, was turned around to port by means of her engines, and then started again to pass by her enemy. The second torpedo left the tube at 400 meters range. It had become so light that we could clearly see the air-bubble trail of this shot. After a few seconds there followed a powerful detonation in the neighborhood of the navigating bridge of the Russian cruiser. A giant, black smoke cloud, mixed with gray smoke, white steam, and spray, rose to a height of about 150 meters. Parts of the ship were torn off and flew around in the air. We could see the cruiser break in half. Bow and stern went under. Then the explosion cloud covered everything over, and, after it had cleared away, about 10 to 15 seconds later, there remained nothing more to be seen of the cruiser except the truck of her mast.[1]

The water where the ship sank was filled with floating wreckage and swimming men. The *Emden* did not have to bother about the swimmers. There were many fishing boats in this neighborhood who could readily rescue all the men.

We ceased firing in the meantime. The other two places that were firing at us also ceased. We still could not determine from whence came the shells.

[1] As a result of a court martial held August 21-25 at Vladivostok over the loss of the Russian cruiser *Jemtchug*, the following verdict was presented:

The captain of the ship, Baron Tscherkassof, was found guilty of the following negligence: He had been in command of the *Jemtchug* since June 14, 1914. On August 25, 1914, he left Vladivostok for the scene of hostilities, where he was to place himself under the direction of the British Admiral Jerome. In spite of the fact that he was on war service, he had given the order that in case of smoke or lights on the horizon no general call should be given; he had not seen to it that the crew should sleep at regular hours; at night he had not increased the number on duty; he had not put torpedos in readiness for an engagement; on entering harbor he had given orders to put the ship out of war trim; during the ship's stay in port he had allowed her to lie at anchor with open lights; with only an anchor watch, and with strangers at liberty to visit the ship and look her over freely.—*Norddeutsche Allgemeine Zeitung*, 1/10.

Soon we saw the French gunboat *D'Iberville* lying at anchor, hidden among the merchant vessels. Evidently that was one of the places from which we were fired on. The captain had just given the order to turn to port in order to pass the wreck of the *Zemtchug* and head for the *D'Iberville,* when the lookouts reported an enemy destroyer standing in. We could not permit her to attack us in the narrow confines of the harbor. It was impossible to maneuver in here so as to avoid a torpedo shot. Therefore the captain turned toward the destroyer at full speed in order to engage her in the outer and larger part of the harbor. We could plainly see the craft heading straight for us. The high, narrow bow, the low, broad smokepipes behind, coming at us at high speed. She seemed to be a typical English destroyer of a large type.

At 4000 meters we opened fire on her. High splashes where our shells hit arose all around and close aboard her. Then the vessel turned hard to starboard. It became evident that she was a fairly large English government steamer. The mirage that is especially strong just at sunrise, had so distorted the appearance of the ship that she seemed to be exactly like a destroyer. We ceased firing immediately.

On coming about in order to attack the *D'Iberville* once more, it was reported that a large merchantman was standing in. Even at a considerable distance we could make her out to be a merchant vessel. The captain then decided to capture her next. The *D'Iberville* could not escape us anyway. Our cutter was quickly lowered. The steamer received the usual signal, "Stop, we are sending a boat!" But hardly had our cutter gone alongside the steamer when we again saw a warship heading in from sea. Therefore we recalled and hoisted the cutter, and headed for our new opponent.

The mirage this morning seemed to be exceptional. The form of the oncoming ship changed every second. At first she appeared to be a large black ship, with smokepipes fore and aft. Without doubt, a man-of-war. Then she suddenly seemed to shrink. Half of the smokepipes disappeared, and she then appeared to be a small gray merchantman with black rings around her smokepipes. A few minutes later she changed her form once more. She had become very small, very black, and with two smokepipes. Therefore, we finally decided that she was a warship of some sort, probably a French destroyer. Now, up and at her!

The *Emden* at this time flew no flag. Neither did the approaching vessel. When about 6000 meters away the on-comer hoisted the tri-color. So, now a Frenchman! She came toward us uncertainly and seemed throughout to fail to grasp who we were. What caused her to act like this is beyond me. She certainly must have heard the firing of the guns and the detonations of the torpedoes, and after that she might at least have expected to see a cruiser standing out of the harbor. In spite of that, she held her course passing us. When the range became 4000 meters we hoisted our battleflags. The *Emden* turned slightly to port, showed her our broadside and the first salvo was on its way toward her. And now the French ship knew with whom she had to deal. She turned hard to port, put on full speed and attempted to escape. Too late! The third salvo landed five hits on her quarterdeck. An explosion, evidently a magazine, a large cloud of black coal dust and white steam covered the entire after part of the ship. In spite of the evident stupidity of the French ship, we must give her credit for manning her battery very promptly. Two torpedoes were launched at the *Emden*, while the bow gun opened fire on us. The torpedoes did not reach their mark as the *Emden* was beyond torpedo range. They came up about 900 meters off our starboard beam. The bow gun fired only a very few shots before it was smothered under a hail of shell from our guns. Mast, smokepipe, forward tower, superstructure, ventilators, and all were knocked overboard. In a very few minutes she sank. She was the French destroyer *Mousquet*.

The captain stopped at the place where the ship had sunk. Both cutters were lowered and the live swimmers were picked up. Many of these floated about, some holding on to wooden wreckage, others, with life-belts on, strung out at great distances apart. This showed that the first men to jump overboard must have done so at the very beginning of the fight. In the *Emden's* cutters were the doctor and such first-aid material as could hastily be collected. As our cutters approached the swimming Frenchmen they did the most remarkable thing, that is, they tried to swim away from the rescuing boats. The beach was so far away that it was impossible for them to swim that great distance. The reason for their fleeing from our boats came to light later on. We picked up 33 Frenchmen, some of them wounded, also one wounded officer. Thanks to the fact that we had our doctor

ready to go along in the cutters, we managed to have two-thirds of the wounded all bandaged and splints adjusted ready to be hoisted aboard in hammocks by the time the boats returned alongside. Meanwhile another French torpedo-boat was seen to be standing out of the harbor and heading for us. It was high time for the *Emden* to get to sea. It seemed certain that other French and English men-of-war must be in the neighborhood. It was impossible for the unarmored *Emden* to successfully engage in a battle in broad daylight with more powerful warships. Therefore we proceeded to sea at high speed on a westerly course. The French destroyer followed us for some time, but finally disappeared into the rainbow and was never seen again. Our intention of drawing the destroyer out to sea after us, and then turning around and sinking her, was therefore not accomplished.

We did the best we could aboard ship to attend to the wounded and captured Frenchmen. The wounded were given medical attention in the sick bay. A large, firm, wood and canvas house was built up on the starboard side of the main deck, next the engine-room skylight, for the accommodation of the unwounded. We had in our crew two seamen who spoke French fluently. These were relieved from all duties and assigned as interpreters for the wounded in the sick bay and for the other prisoners on deck. We quickly hammered together a few benches and tables. Although our men had few clothes left, they voluntarily and willingly gave clothes to the prisoners, most of whom had arrived on board with very little on. The prisoners were given food, drink, and smoking material. They were restricted as little as possible in their movements about the decks.

When we asked the Frenchmen why they swam away from our rescuing cutters they gave this answer: "In our newspapers we read that the Germans massacre all their prisoners. We, therefore, preferred drowning to being murdered. The officers also told us the same things which we had read in the newspapers."

On further questioning, when we asked how it happened that on the previous night they allowed the *Emden* to pass on into the harbor, they answered that they had seen the *Emden*. But, as we had four smokepipes, they thought we were the English cruiser *Yarmouth* and therefore did not hinder us. Most undoubtedly the white light that we sighted during the night off

Penang must have been this French destroyer. They explained that their captain had both legs shot off by one of our shells. He could have been saved, but he lashed himself to the bridge in order to sink with his ship, because he did not care to live and face the shame of having had a part of his crew jump overboard at the very beginning of the fight. Hats off to an officer of this caliber!

Among the wounded there were three serious cases. Recovery was impossible. One died the first evening, and the two others the next day.

The first dead man was, according to the customs of the sea, sewed up in canvas and weighted, and lay in state on the starboard side of the quarterdeck. The corpse was covered with the French war flag. A sentry stood watch on this post throughout the night. The next morning the dead was buried from the starboard gangway. The ship was stopped during the ceremony. One division of the *Emden's* seamen, in parade uniform, took part in the ceremonies. All the unwounded Frenchmen also took part. A guard of honor with rifles and commanded by an officer, attended. All the German officers, wearing service uniforms and their medals, were present. The captain spoke a sermon in French. Among other things he said that the departed had died with honor in the service of his country and that the enemy would not deny him any of the honorable ceremony which he deserved. Then followed a prayer, read from our Catholic prayer book, as the Frenchman was of that religion. As the corpse, covered with the French flag, disappeared into the deep, the guard of honor presented arms and then fired three volleys over the grave. The officers stood, at the salute, alongside the gangway. The same ceremonies were repeated the next day when the other two were buried.

After a few days we were able to transfer the Frenchmen to an English steamer whose neutral cargo we could not destroy. When they were told to prepare to leave the ship, the two eldest petty officers came to me with the request to see the captain. They gave the captain their thanks and the thanks of their comrades for the honorable and humane treatment and reception which they had received on board. They now knew that what their newspapers had said about the Germans were lies and they would do all they could when they reached home to spread the truth. Both these petty officers said the same to me.

The badly wounded officer, on leaving the ship, requested one of the *Emden* cap ribbons. He said that he wished to have a keepsake from a ship whose officers and men behaved in such a humane and honorable way to a wounded and defeated enemy.

We also transferred to the steamer a large quantity of medicinal supplies, so that the wounded would be properly taken care of. The steamer then received orders to proceed to Sabang in order to land the Frenchmen. The nearest hospital was at that place. Later on we read in the newspapers that unfortunately the wounded officer had died there.

The most ridiculous reports were made by the English in regard to the Penang battle. They complained that the *Emden* had approached the harbor under the English flag and for this reason was not recognized. They also said that the *Emden* had gone into the harbor by the southern entrance and had left by the northern entrance. These reports are groundless and untrue. In the first place the *Emden* never flew the English flag, and further it was night when the *Emden* came in. The carrying of a flag therefore would have served no purpose. The southern entrance to Penang is so shallow that the *Emden* could not possibly have entered that way. The only thing in the English reports worth attention is the praise devoted to our captain, referring to our picking up the Frenchmen after the *Mousquet* sank.

Here again was shown the knightly conduct of the *Emden's* captain, the conduct which he repeatedly exhibited in his meteoric career during the war. As the French torpedo-boats might have dashed out any time, every second was precious to him. Without considering for a minute his own danger, he stopped and sent out boats to pick up the remainder of the living of the *Mousquet* before he again proceeded on his way. As the report reads, "He played the game."

Further, I will permit myself to quote the following words, "And so ended this engagement that will forever remain as an historical example of the possibility of two ships, approximately of the same power, engaging in battle in broad daylight at the shortest possible range, without both of them being totally destroyed. A case such as that which occurred yesterday, has always been considered by all naval authorities as either impossible or a case of suicide."

The authorities evidently referred to men other than those under the command of our captain.

VI. OUR DAILY BREAD

The principal consideration aboard our ship was the providing of coal. The collier *Markomannia* had devotedly followed us on our cruise from Tsingtao to the southward into the Indian Ocean. The supply of coal practically ceased when our presence in the Indian Ocean became known. There were no harbors into which we could run to get fuel. We therefore had to earn our daily bread. And then we had the good luck to take, as our first prize, the collier *Pontoporros,* which brought us several thousand tons of coal. But, as I said before, her coal was of such an inferior quality that it could not be used except in case of urgent need. For a while we tested the *Pontoporros* coal. A heavy, black, treacherous mountain of smoke hung over the ship. The boilers choked with soot and were reduced in efficiency. The whole deck was always covered with a fine rain of unburned or partly burned cinders. The dirty coal dust penetrated through all crevices and into all air ports. In short, everybody prayed for a better quality of coal.

We took more pleasure in capturing that steamer containing several thousand tons of excellent Welsh coal than we would have taken in capturing a ship full of gold.

The *Emden* was constantly being coaled. We had to have a large quantity of coal on board in case we had an action forced on us. Therefore, we never permitted our amount of coal on hand to drop below a certain percentage. And so the coaling of the *Emden* became almost a daily performance—our daily bread.

Coaling ship is not an easy or pleasant job for the crew. The tropical heat made itself felt. Especially in the bunkers, where the firemen had to trim the coal, the temperature was often unbearable. While coaling, wearing apparel was reduced to mere nothing. The so-called "coaling-packages," that is, the old and worn outfits which are worn only when coaling ship, were soon in a poor state of repair due to their constant use. We could not get other clothes to replace these. The trousers, which were originally of the regular length, gradually came through at the calf and then at the knee. After a time the long trousers became short ones, a little later the short ones becames bathing trunks, and again a little later—of this, I will not tell! I need only

remark that the uncovered parts were soon hidden by coal dust. We had to coal at sea. A constant and appreciable swell runs in the Indian Ocean at all times. The ships never ceased rolling. Never was the operation entirely free from danger.

We used so-called fenders to protect the ships when coming alongside each other. These are heavily plaited mats or balls of roping. They are used to protect the ships and prevent the heavy rubbing of one against the other. Due to the excessive rolling of the *Emden* and her colliers, the fenders soon wore out. We also discovered that they were not sufficiently large to stand the operation of coaling at sea. So we had to get to work making new ones.

Before leaving Tsingtao I took 150 hammocks along. Originally my idea was to use them for stopping leaks. In case of injury below water, hammocks can be used to plug up the holes and thereby reduce the amount of water streaming in.

The hammocks now came in handy. We made great, long fenders in which we secured heavy logs about four to six meters long, and suspended them along the sides of the ship. The fenders were usually pretty well used up by the time each coaling was finished, but new ones could be made ready for the next coaling.

One of the best fenders of that style was made of automobile tires, a great number of which we took from one of our prizes. All along the sides we hung these tires and they made most excellent buffer cushions.

Coaling at sea is at best a tedious business. The two ships, tied up side by side, always rolled quite heavily. When the coal bags were hoisted up to the tops of the coaling booms we had to wait some time until the proper moment when the ships rolled toward each other. Then the falls were let go and the coal bags landed any old place on the *Emden's* deck. The men had to learn to spring aside at the proper moment in order to save themselves.

The constant surging of the vessels against each other and the heaving of the heavy coal bags on the *Emden's* decks caused no little damage, as you may well imagine. We always coaled on the starboard side of the ship. The *Emden* had a swallow's nest forward and aft in each of which a gun was mounted. (Sponsons.) When the ships rolled together the forward sponson was always in danger and had, at various times, been crushed in. The main

sight was attached to the left side of the gun. When we coaled on the starboard side it was impossible to damage the main gun-sight.

The auxiliary gun-sight, which was secured at the right side of the gun (outboard) was crushed after a short time. The gun-shutters of the sponson had been crushed in by a collision with the collier and smashed against the gun.

The coal bags constantly struck the rail. Soon there remained not one single whole stanchion along the whole starboard side. The linoleum deck received rough treatment. As a result one could see the steel deck through the large holes. However, that did not harm the deck very much. But the exposed deck was so slippery that the men constantly fell, especially at night or when the ship rolled. Whenever we finished coaling we proceeded to roughen up the slippery spots, that is, we cut small grooves in the deck, so that it would furnish a better foothold. Then, when we managed to get a supply of canvas and tar from some of the English ships, we covered up the exposed steel deck.

As I said before, the *Emden* had to have as much coal aboard as possible all the time. Therefore, we not only kept the bunkers full, but also carried a deck load. Forward on the port side, amidships next the engine-room skylight, and aft on the poop, we piled mountains of coal. Communication about the ship was naturally made rather difficult. If we wanted to get along on the upper deck, it became necessary to squeeze through narrow passageways between piles of coal as high as a man's head. Frequently it also happened that the heavy roll would cause the coal to slide and then the whole deck was scattered full of it.

Coal dust and coal dirt was found all over the ship. Whenever we had a deck load we would strike as much as we possibly could down into the bunkers the first thing after reveille each day. The wooden deck suffered a great deal by the constant dragging of the heavy coal bags. Deep, dirty grooves were worn in the wood. Oil stains were to be seen everywhere. Of course, the paint work itself was ruined. No one who had seen the *Emden* before would have recognized her now as being the same ship, for when she was cruising the East Asiatic station she was known as the "Swan of the East" because her condition always appeared to be above reproach.

Our enemies had always thought it was impossible to coal in the open ocean. They evidently were judging from their own

standard of seamanship. We heard that they were constantly searching for us in all the quiet harbors and hidden anchorages in the hope that they would some day catch us coaling in one of those places. Instead, rolling peacefully, we were coaling at sea.

I can still see the troubled and questioning face of the English captain of our prize *Buresk*—he had, as said, gone over into our service—when, during a period of heavy rolling, the *Buresk* received the signal, "Prepare to coal." He assumed this to be impossible and thought that both ships would be wrecked. About six or eight hours later he had to admit that the seamanship in the German Navy is not the slightest bit disturbed by heavy rolling or a strong seaway.

The coaling always took a fairly long time. In spite of that the *Emden* had right fair success. When the weather was unfavorable we used to take on about 40 tons per hour. But we also had times when the weather improved a bit. Then we would average 70 tons per hour. Whoever has coaled from a collier at sea will readily admit that this was a good record.

We coaled alternately from the *Buresk* and *Exford*. Although the *Emden* did not entirely escape injury, due to the continuous rolling, still our greatest anxiety was the fear that the colliers could not stand it. They were brand new ships, built in England, and making their maiden voyages. But they were so lightly and poorly constructed that at the conclusion of every coaling they bore great indentations along their sides. Regular trash!

Those hours when the *Emden* had a collier alongside and was busily engaged in coaling were very dangerous ones for us. The ship was not cleared for action. We knew that the circle of death surrounded us. Any moment an enemy might appear over the horizon and attack us. In that case we would be obliged to make many preparations before we were ready. During the coaling it was imperative that the guns be kept covered over. Likewise they had to be run in because they projected from the side and might have been injured (by the collier). Therefore, it was always necessary to finish coaling as soon as possible. The men also understood this and put forth their greatest efforts.

The work was lightened as much as possible. The steward prepared huge tubs of lemonade up forward. The mixture was cooled off by the addition of ice. Can after can was filled with

lemonade and carried to the working men. The band played lively airs. A large bulletin board was set up amidships so as to be visible from all around. Each quarter hour the amount of coal received was chalked up on the board. The figures were quoted for each ship's watch. Neither watch would admit the superiority of the other. They eagerly noted the increases of the other watch and then, by doubling their efforts, attempted to break the record.

High up in the tops sat the lookouts, armed with binoculars, and with wide-awake eyes searched the horizon for possible smoke clouds or mast heads.

ITINERARY OF *EMDEN*

Location	1914	Remarks
Yellow Sea	August 2	Outbreak of war
Tsingtao (arrived)	August 5*	
Tsingtao (left)	August 7	
Met fleet, probably at Lamotrek Island (Caroline group)	August 12	
Entered Bay of Bengal	September 4*	Route uncertain, Aug. 12-Sept. 4
Off Calcutta, India	September 10-14	
Off Rangoon	September 18*	
Madras	September 22	Bombardment
Off Colombo	September 30	
Diego Garcia	October 5-10*	
Off Minokoi Island	October 15-20	
Penang	October 28	Sank *Zemtchug* and *Mousquet*
Straits of Sunda	November 1-6*	
Keeling, Cocos Island	November 9	Destroyed by Australian cruiser *Sydney*

* Indicates approximate dates.

When the coaling had reached the point where the collier could shove off, we turned-to on stowing the deck load. When that was finished we tried to get at least the thickest of the dirt clear of the sleeping places. Then the crew washed, took a shower and changed clothes. After this they had their supper, and shortly thereafter turned in. Very often it happened that the exhausted men had hardly gone to sleep when some steamer was sighted and then they had to be called on for several more hours of strenuous work.

No, it was not an easy life. No one, however, had any idea that it could be otherwise. One time, at my suggestion, the captain permitted a steamer to get away because I told him the men had just completed ten strenuous hours of coaling and had about reached the point of exhaustion. The next day, when this became known, a growling grumbling was heard: "We would have fixed that one too."

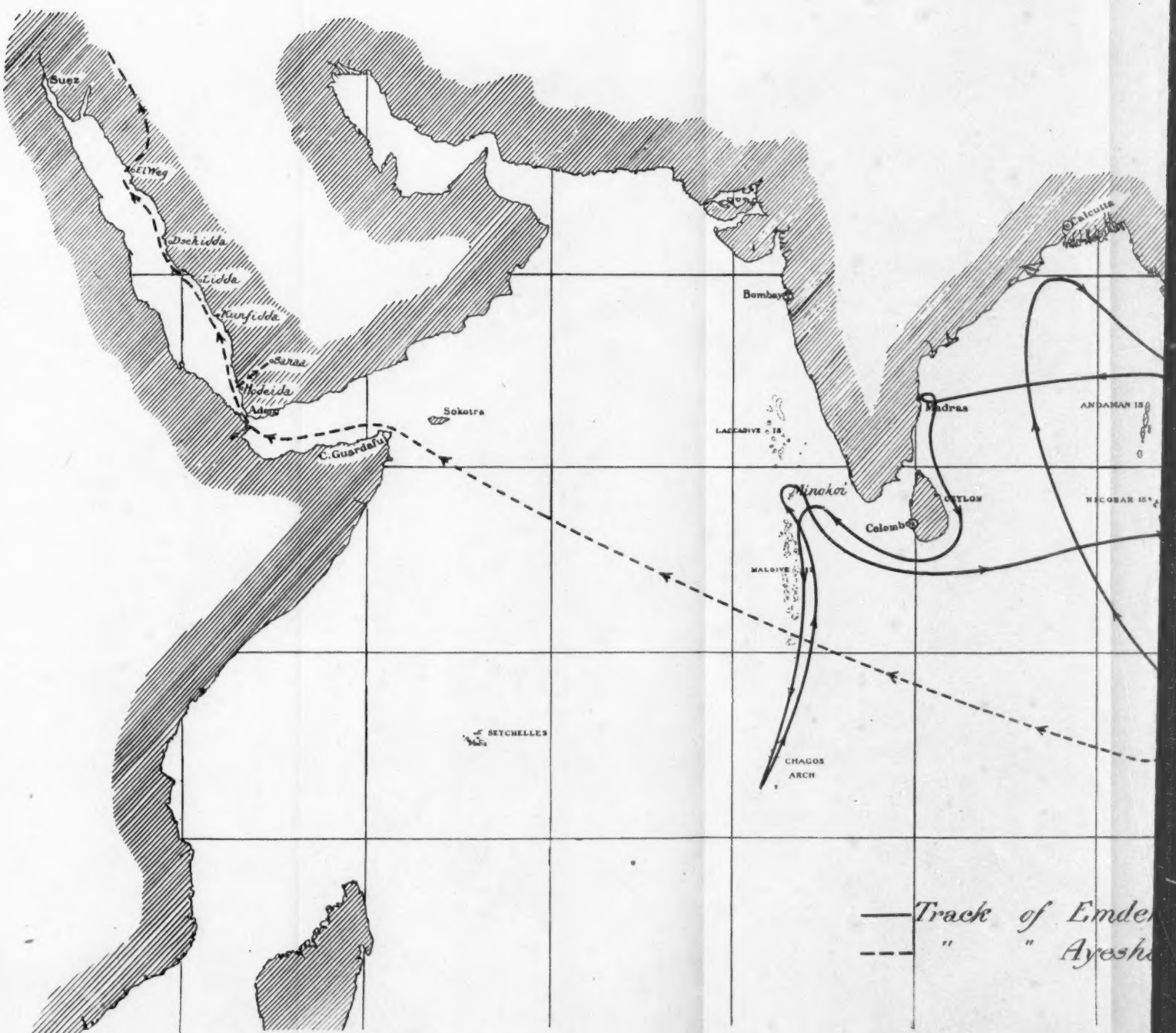
TRANSLATOR'S NOTE.—A study of the accompanying chart and of the itineraries of the *Emden* and of her landing party, and also of the table of vessels sunk by the *Emden*, will accurately locate the scenes of all operations.

EMDEN'S VICTIMS

Date	Name	Voyage	Cargo	Value	Tonnage	Remarks
Aug. 3, 1914	Rjesan	Hong Kong to Vladivostok	Passenger Steamer	.....	3,522	Taken to Tsingtao. Converted into auxiliary cruiser under name of *Cormoran*. Later on interned at Guam
Sept. 10, 1914	Pontoporros	.....	Coal	.....	4,049	Captured. Recaptured by English cruiser *Yarmouth*
Sept. 10, 1914	Indus	Calcutta to England	General	$ 690,000	3,393	Sunk
Sept. 11, 1914	Lovat	Calcutta to Bombay	Ballast	300,000	6,102	Sunk
Sept. 12, 1914	Cabinga	.....	.....	.....	4,657	Captured. Loaded with crews of other ships and then let go
Sept. 13, 1914	Killin	Calcutta to Colombo	Coal	215,000	3,544	Sunk
Sept. 13, 1914	Diplomat	Calcutta to England	General	1,500,000	7,615	Sunk
Sept. 14, 1914	Trabboch	Negapatam to Calcutta	Ballast	100,000	4,014	Sunk
Sept. 14, 1914	Clan Matheson	.....	.....	190,000	4,775	Sunk
Sept. 25-30, 1914	King Lud	Alexandria to Calcutta	Ballast	200,000	3,650	Sunk
Sept. 25-30, 1914	Tymeric	Samarang to Falmouth	General	655,000	3,314	Sunk
Sept. 27-30, 1914	Foyle	From Sfax	Ballast	150,000	4,147	Sunk 315 miles off Colombo
Sept. 27-30, 1914	Riberia	Alexandria to Batavia	Ballast	150,000	4,147	Sunk 200 miles west of Colombo
*Sept. 30-9, 1914	Buresk	From Port Said	Coal	160,000	4,350	Captured. After defeat of *Emden*, *Buresk* sunk by own crew before *Sydney* could capture her
Sept. 30, 1914	Gryfedale	.....	.....	.....	4,437	Captured and released
Oct. 15-20, 1914	Clan Grant	Great Britain to Calcutta	General	640,000	3,948	Sunk
Oct. 16-20, 1914	Ben Mohr	Great Britain to Far East	General	815,000	4,806	Sunk
Oct. 16-20, 1914	Ponrabbel (Dredger)	Great Britain to Launceston	Ballast	145,000	473	Sunk
Oct. 18-20, 1914	Troilus	Yokohama to Great Britain	General	3,400,000	7,562	Sunk
Oct. 18-20, 1914	Chilkana	Great Britain to Calcutta	General	1,060,000	5,146	Sunk
Oct. 20, 1914	Exford	From Cardiff	Coal	275,000	4,542	Captured. Recaptured by *Empress of Japan* and sunk off Padang
Oct. 20, 1914	St. Egbert	.....	.....	.....	5,596	Captured. Loaded with crews of other ships and then let go
Oct. 28, 1914	Zemtchug	At anchor in Penang	Russian Cruiser	.....	3,130	Sunk by two torpedoes and gun fire
Oct. 28, 1914	Mousquet	Off Penang	French Destroyer	.....	298	Sunk by gun fire

Markomannia, *Emden's* tender, was sunk by English cruiser *Yarmouth*.
Buresk sunk by own crew before *Sydney* could capture her on Nov. 9, 1914. Took three officers, one warrant officer, and 12 men, prisoners.
A collier was sunk by the *Empress of Japan* off Padang. Probably *Exford*.
*Date uncertain.

(TO BE CONTINUED)



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Buresk sunk by own crew before *Sydney* could capture her on Nov. 9, 1914. Took three officers, one warrant officer, and 12 men, prisoners.
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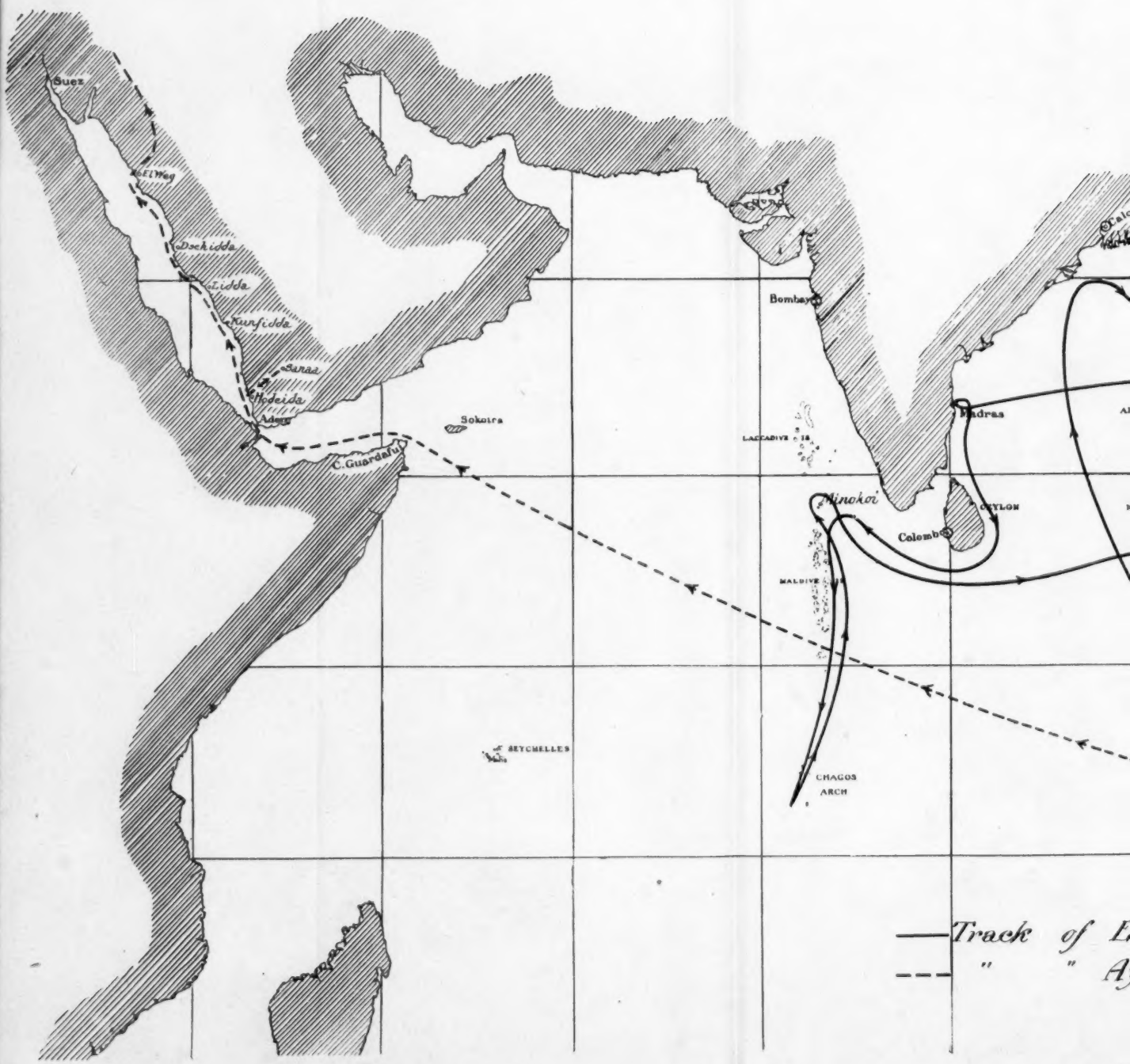
Suez
El Wag
Dschidda
Lidda
Kunfidda
Saraa
Hodeida
Aden
Sokotra
C. Guardafui
Bombay
Madras
LACCADIVE & IS.
Minikoi
CEYLON
Colombo
MALDIVE
SEYCHELLES
CHAGOS
ARCH
Track of
" "

Tsingtau
SOUTH KOREA
TOKIO
Yokohama
Nagasaki
KIUSIU
Shanghai
Hongkong
Calcutta
Rangoon
ANDAMAN IS.
NICOBAR IS.
LUZON
PHILIPPINE ISLANDS
Corregidor
Zamboanga
MINDANAO
Yap
Palau Is.
Penang
MALAY PENINSULA
SUMATRA
Padang
BORNEO
CELEBES
Batavia
JAVA
Christmas I.
Cocos Is.
Emden
Ayesha Party

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U. S. NAVAL INSTITUTE, ANNAPOLIS, MD.

EQUIPMENT FOR NAVY YARD SHOPS

By NAVAL CONSTRUCTOR J. A. FURER, U. S. Navy

Industrial establishments may be classified broadly under jobbing shops and manufacturing shops. In the former, absolutely identical jobs may not be repeated more than a few times in 12 months. On the other hand, in the latter, the same processes may be repeated day after day without variation during the entire year. To the former class belong practically all the shops operated by the Navy Department. Selecting the machinery for doing jobbing work economically is naturally much more difficult than selecting the machinery for a shop which turns out only one or two standard articles. In the case of the latter the processes involved in making the articles are definitely known beforehand and only the exact equipment required to accomplish these processes need be installed.

Highly specialized machines may be purchased for the manufacturing shop by means of which the cost of production can be greatly reduced as compared to the cost of making the same articles in a jobbing shop by means of machinery which must serve all-round purposes. This is one reason why navy yards find it so difficult to compete in cost of production with private establishments that are engaged in manufacturing only the one article in question. Although it must be accepted as axiomatic of manufacturing, that mass production, in a shop specially equipped for repetitive work, can always be accomplished more cheaply than occasional production by the use of general utility machines, there is, nevertheless, much room for effecting economies in the jobbing shop by the installation of the right kind of machinery, located so as to insure the most direct route of the material from the raw state to the finished product, and served by lifting and transporta-

tion facilities which eliminate manual handling to the greatest possible degree.

Congress has not been parsimonious in appropriating funds for navy yard shop machinery. Often, however, the ideal in plant equipment cannot be realized because shop buildings are not always of suitable dimensions to permit of the most desirable machine lay-out, and because many of the present buildings, which were formerly used for other purposes, cannot be equipped with proper material-handling facilities. In such cases the equipment for the shop must be purchased and laid out with even more than ordinary care so as to make up, as nearly as possible, for these initial disadvantages.

The plant problem which must be most frequently solved at navy yards is the purchase of new machines to add to the existing equipment of old machines. The re-arrangement of all of the tools in the shop, together with the purchase of some new machines, is less often called for. The building and fitting out of a new shop is still more infrequent, and the establishment of an entirely new plant is quite exceptional. In the last 10 years only two new plants of any magnitude have been established by the Navy Department, namely, the navy yards at Charleston, S. C., and Pearl Harbor, Hawaii.

The broad problem of laying out an entirely new plant would at first sight appear to be of only general interest to officers in the service at large. Without some conception, however, of the considerations which should govern the equipment of a complete plant, or at least the layout of an entire shop, it is difficult to attack intelligently the smaller problem of adding equipment to an already established shop. This smaller problem comes up frequently and is likely to present itself at any time to officers on navy yard duty. In principle, the procedure followed in determining on the characteristics of a single additional machine, its purchase, and its installation is much the same as that for providing the entire equipment for a new shop. A general description of the latter procedure will therefore be given.

The primary consideration governing the layout and purchase of the equipment for a new shop is, naturally, the purpose which the shop is to serve. This is obvious, but the equipment which must be provided to accomplish this purpose is not so obvious, because navy yards are essentially jobbing establishments. The

difficulty lies in anticipating with any degree of accuracy just what work the jobbing shop will be called on to do. With respect to some of the equipment needed there is no uncertainty. Even for a navy yard plant, the kind and capacity of some of the machines which must be provided is obvious.

For instance, it is obvious what the size of the largest boring mill for a fleet repair yard should be. But it is far from obvious how many 16-inch engine lathes should be installed in the machine shop. It is also, for example, obvious what the size and capacity of the large, plate-bending rolls for the ship-fitters' shop should be. But it is far from obvious what the capacities of the various punching machines for this shop should be. It is, in fact, quite impossible to state offhand in the case of any shop what the kind, number, and capacity of machines should be to insure a well-balanced equipment, all of which will yield a reasonable return on the investment.

When a manufacturing plant is being laid out, the industrial engineer knows what output is being aimed at. He also knows exactly the processes which must be accomplished by machinery to turn out the finished products economically. The matter of providing the necessary equipment for each shop is, therefore, comparatively simple. The problem is, however, not nearly so clear cut for navy yard shops. The only reliable method of arriving at most of the equipment which should be provided for the latter is to compile machine employment data from shops already in existence, and to analyze the various jobs which are most frequently done in the shops. This procedure is also the one which should be followed in determining on additional equipment for an old shop.

DETERMINING WHETHER A NEW MACHINE IS NECESSARY

Requests for new machines usually come from the shop superintendent, or from the shop foreman. This is true for any establishment, whether government or private, because the person who is immediately responsible for getting out the shop work on time and at a price is the first to feel the lack of adequate equipment, whether the lack is in capacity, or in kind. Very frequently, however, the circumstances under which the insufficiency or lack of capacity of the existing equipment makes itself felt are unusual, and should not be taken as the criterion of the average shop conditions.

Many a new machine is purchased in a hurry, both by the government and by private establishments, only to be regretted at leisure, because the peak load or the unusual job was assumed to be the normal condition of shop activity. The first cost of an ill-advised purchase is usually the least to be regretted feature of the new addition. One of the important considerations which is apt to be left out of account is the room which the new piece of equipment will occupy. Floor space is one of the assets of a shop which should not be lightly squandered. This is especially true of navy yard shops, because of the limited room for additional buildings in many of the yards, and because of the difficulty of obtaining appropriations for new buildings to replace old ones. Floor space is not only an area where raw material or finished products may be temporarily stored—it has, in addition, potential possibilities for better routing, or for future improved arrangement of machines.

The only certain way to guard against the purchase of unnecessary or unsuited equipment is to collect data showing just what the machines on hand have been used for, over a sufficient period of time to arrive at the shop conditions which are likely to hold good for a reasonable future period. Many private establishments automatically obtain such data by way of their cost keeping system where the machine rate is the basis of obtaining manufacturing costs. In the absence of a cost keeping system at navy yards which shows the activity of the various machines, a fairly satisfactory substitute is to collect the data independently.

The simplest way to collect such data is to provide a pad and a pencil at each machine of the type claimed to be inadequate in number, or in capacity. On this pad, which should be appropriately ruled, an entry is made every time the machine is used, giving the time of starting and stopping for each job and the size of the piece processed. These sheets should be collected each day and the data posted to a prearranged, machine-work classification.

For example: Suppose that the machine shop makes a request for an additional 20-inch engine lathe. Data such as referred to should be collected showing the work being done on all the lathes of every size in the shop. It may be necessary to carry on this investigation for several months in order to arrive at not only the normal shop conditions but also the activity during congested periods, such as the docking season of vessels.

The entries on the pads can best be made by the machine operator himself. Trouble is sometimes experienced in persuading the men to make these entries as they are apt to misunderstand their purpose. The excuse most frequently given for failure to record jobs is that the men have dirty hands and cannot keep the sheets looking neat. It makes no difference whether the pad becomes soiled or not, because after the data have been distributed, the sheets may be thrown away. The collecting of such data may be a nuisance—so is time-keeping a nuisance, but it is necessary nevertheless. Any other method of arriving at the activity of the machines already on hand is bound to be at least nine-tenths a guess.

With data of this kind on hand there is then no longer any necessity for accepting someone's opinion as to whether additional machines are needed or not. Very often the machine employment records will show that by better routing or by more systematic distribution of jobs the equipment on hand can be made to suffice, or that instead of purchasing a 20-inch lathe as was perhaps originally contemplated a 14-inch lathe will answer the purpose equally well or better. The latter fact would be brought out by the record of the size of the pieces which were processed in the lathes during the period investigated. A record of this kind will also show whether work is being done on the machines alleged to be inadequate which could be done to better advantage on some other kind of machine. If the record indicates that congestion occurs only occasionally and then only for a short period of time, it may pay to accept this occasional lack of capacity of a shop, rather than add a new machine.

If this method is followed in arriving at the requirements for new machine equipment, the authority reviewing the requisition can be given data to confirm the desirability of the purchase instead of merely an opinion. Doubtful requisitions will never leave the navy yard, and, consequently, unnecessary requisitions will die a natural death at the source. As to the delay involved in accumulating such data—it is questionable whether the purchase of a new machine in a hurry is ever necessary. It is always possible to anticipate the need for additional equipment by at least six months or a year, which allows ample time to look fully into the machine capacity conditions of the shop. From the data procured in this

way it is then possible to determine definitely whether a new machine is needed or not, and what its size and characteristics should be.

ARRANGEMENT OF MACHINES

Very often it will be found that the new machine does not fit in with the existing equipment. The only floor space available may place it in a disadvantageous position for routing the material through the shop in the most economical manner. This may make a general rearrangement of the shop desirable; or the transfer of the shop to a new or to a larger old building may be tied up with the purchasing program. A great many shop re-arrangements of this kind have been found necessary at navy yards in the past few years.

Before going ahead with the specifications for the new machines, the entire shop layout should, under such circumstances, be planned and fixed, as in the case of many machines certain important characteristics are largely influenced by the location of the machine with reference to other tools. The determination of the best machine layout for a jobbing shop is considerably more difficult than for a manufacturing shop, just as the purchase of the most suitable machines for the former is more difficult than for the latter. The method of fixing on the location of machines with reference to one another in a jobbing shop will be briefly described.

In spite of the fact that in the jobbing shop a great variety of work is done, there are always certain machines which, on the average, are called upon to perform the first operation oftener than other machines. Going a step further, another machine may in the majority of cases be the next in order, so far as the sequence of operations is concerned, and so on. Analyzing a large number of jobs and tabulating the sequence of the processes involved in doing each job is the only way to ascertain the layout of machines which will, for average conditions, insure the simplest routing of the various jobs through the shop. The object should always be to have the material go straight through the shop from machine to machine without doubling back on its route, thus avoiding interference with following work and reducing handling costs to a minimum.

In order to show more clearly how adequate equipment and a logical layout may be arrived at, the determination of these points

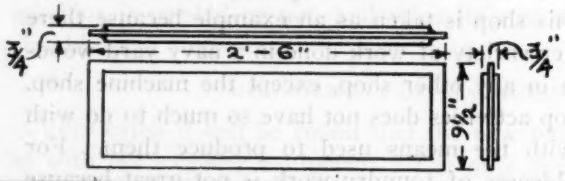
for the light machines of a wood-working shop will be taken as an illustration. This shop is taken as an example because there is probably a greater variety of work done in a navy yard wood-working shop than in any other shop, except the machine shop. Variableness of shop activities does not have so much to do with the products as with the means used to produce them. For example, the variableness of foundry work is not great because the equipment needed to make castings is simple in kind and small in variety, although the variation in the shapes of the castings turned out may be infinite.

The first step, then, preparatory to determining on the machines which should go into the shop and their location with relation to one another, is to route a large number of the jobs which are likely to be done in the shop. The routing can best be recorded on forms, such as shown in Fig. 1. The routing given is that for manufacturing a panel, such as is fitted in doors and furniture. It will be noted from the figure that the first operation consists of cutting the rough board as it comes from the lumber pile to the required length. The second operation is accomplished on a rip saw and consists in taking off the surplus width, leaving only a shaving to be removed from the edges on a jointer. By the third operation the panel is jointed to exact width and is given square edges free from wind. The fourth machine used on this particular job is the surfacer, on which the panel is planed to the right thickness and given the requisite smoothness. The last machine operation is performed on a shaper.

The data from the route sheets are now tabulated according to the sequence of the machine operations, as shown in Fig. 2. It will be noted that the vertical columns are designated 1st, 2d, etc., to 8th. On the left-hand side are given the names of the machines. In the case of the distribution from the route sheet, Fig. 1, a tally is made in the first column opposite the cut-off saw; in the second column opposite the rip saw; in the fourth column opposite the planer, and in the fifth column opposite the shaper. By distributing data from route sheets covering 30 jobs, it is found that the cut-off saw, in the case of 15 jobs, performed the first operation; that the surfacer performed the first operation in the case of 14 out of 30 jobs; that the rip saw was the second machine used on 13 jobs, and so on.

SHOP WOODWORKING — SHEETS, SHEET No.

MACHINE ROUTING FOR MANUFACTURING PANEL.



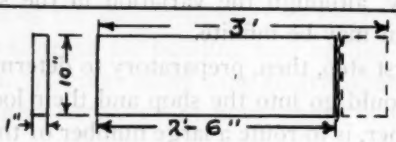
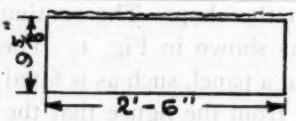
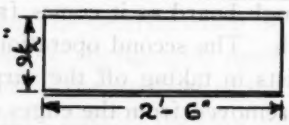
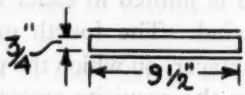
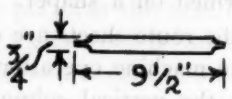
Oper. No.	Description of Operation.	Sketch of Operation.	Machine Used.
1.	CUT OFF TO LENGTH.		CUT-OFF SAW.
2.	RIP TO ROUGH WIDTH.		RIP SAW.
3.	JOINT TO NEAT WIDTH.		JOINTER.
4.	PLANE TO THICKNESS.		SURFACER.
5.	RAISE PANEL.		SHAPER.

FIG. 1

SEQUENCE OF MACHINE OPERATIONS.
SECOND FLOOR, WOODWORKING SHOP.
30 JOBS.

Machine Used.	1.	2.	3.	4.	5.	6.	7.	8.
CUT-OFF SAW.	𝍸 𝍸 𝍸	𝍸						
RIP SAW.	𝍸	𝍸 𝍸 𝍸						
SURFACER.	𝍸 𝍸 𝍸			𝍸	𝍸			
JOINTER.		𝍸 𝍸	𝍸	𝍸				
MOULDER.			𝍸	𝍸				
BAND RIP SAW.								
SAW BENCH.			𝍸	𝍸	𝍸	𝍸		
WOOD BORER.								
DOWEL MACH.								
MORTISER.								
TENONER.								
SANDER.								
LATHE.								
SHAPER.								
JIG SAW.								
CLAMP.								

FIG. 2

A glance at the tabulation indicates at once that the cut-off saw should logically be placed nearest the incoming end for raw material; also, that for many jobs planing is the first operation, hence, that a surfacer should also be near the incoming end. In order to give both machines an equally advantageous location, the surfacer may be placed to one side and abreast of the cut-off saw. The rip saw, although employed a few times for the first operation, comes into use more often as a second operation machine. The jointer, also, is frequently used for second operations. It is, therefore, a possible question as to which of these machines should follow next after the cut-off saw.

The simplicity of laying out the manufacturing shop as compared to the jobbing shop is well illustrated by this example. If a desk factory were being laid out, there would be no question as to which machines should come 1st, 2d, 3d, and so on, because the best sequence of processes for building desks would be planned as the initial step in the layout and the machines would then be located accordingly. In fact, the sequence of operations for making a large number of panels would be quite different from that for making one panel. The boards would be ripped and planed in their full length before being cut up so as to save handling expense. Also the last operation of raising the panel would be done on a special machine.

Often the only way to effect a satisfactory layout is to duplicate in type, even if not in capacity, certain machines which are much used, especially if the order in which the machines are used varies considerably. It will be noted, for example, from the tabulation in Fig. 2, that the jointer is an active machine—in fact more so than indicated merely by an analysis of the millwork done in the shop, because it is also much used by the bench-workers. Several jointers must be provided if work is to be done economically in all parts of the shop—one being located with reference to the millwork and the other with reference to the bench work.

The desirability of providing sufficient room between machines to avoid interference of stock being processed or standing on trucks at adjacent machines is obvious. It should be possible to use all of the machines in the shop simultaneously without interference one with the other. The space between machines should be sufficient to make it possible for the helper at the outfeeding end of one machine to pile the processed material directly on a

truck without a carry and without blocking off access to the next machine. This is particularly important in wood-working shops where the number of pieces handled is large. It has been estimated that it costs approximately two dollars a thousand board feet to lay down and pick up lumber of the average size being fabricated in a wood-working shop. It is obvious, therefore, that considerable economy will be effected by providing enough room between machines to permit placing a truck at the infeeding end, and another at the outfeeding end, of each machine. Room to this extent avoids the necessity of piling fabricated or raw material on the floor temporarily, and, hence, saves the two dollars a thousand involved in the additional handling required to pick up the pieces again and to place them on trucks preparatory to the next fabricating process.

It will be noted from Fig. 2 that certain machines are much more frequently used than others. Emphasis should always be laid on the advantageous location of those machines which are most actively used. Wood lathes, plug machines, dowel machines, mortisers and a few others are more or less special machines. These can be located, without serious disadvantage, more with reference to floor space available, than with reference to locations determined by the order in which they are used.

The procedure outlined above for laying out the equipment of a wood-working shop can be followed with advantage for any other shop. Each shop has, of course, its special requirements, depending on the methods of handling the raw material used and the nature of the products turned out in the shop.

In the preliminary stages of preparing the layout plan, considerable shifting will be found unavoidable in order to insure satisfactory locations and spacing of machines. The quickest and most flexible method of making these adjustments is by the use of cardboard templets of the machines. The templets should be cut from a good quality of light cardboard to the same scale as the floor plan of the building. They may be conveniently fastened to the drawing board on top of the plan by means of push pins. The shop floor plan should not be too small, otherwise the templets will have to be made inconveniently small also. Floor plans one-fourth of an inch to the foot are the most satisfactory to work with, although this makes a rather large plan for a long building. A scale of one-eighth of an inch to the foot will answer the pur-

pose. The cardboard templets should show the infeeding end of the machine and should also include the motor, if the machine is to be individually driven, and any other projections such as countershaft pedestals, pulleys, etc. The templets must, of course, conform to some standard make of machine for this preliminary work. The floor space occupied by the machines as given in catalogs is not, however, always reliable for this purpose as it seldom includes the space required for the drive. The side of the machine from which adjustments are made should be kept in mind in preparing the layout plan. This does not mean only the infeeding or working end of the machine, because naturally this governs the direction in which the machine must be faced; but also the side of the machine from which the operator makes adjustments and sets cutters.

In the case of a new shop the layout and arrangement of the machines should really be fixed before the building is designed, thus making it possible to provide the necessary length, width, and height to house the equipment at minimum expense without sacrificing operating advantages. If the shop has already been built, it is often necessary to leave out important machines, or to cramp those which must be installed, to such a degree as to make the handling and transportation cost in the shop excessive. A compromise is in such cases necessary. The best compromise under the circumstances is possible only by making a preliminary investigation such as described, and by attacking the layout problem systematically.

STANDARD *vs.* SPECIAL MACHINES

Having determined what machines are to be purchased and what character of work is to be done on each, the next step is to prepare the specifications for the machines. The usual practice in this respect is to obtain, from the manufacturer of a good standard machine of the kind and size needed, a complete specification, which is then used *verbatim* in the requisition. This practice is not to be recommended in all cases, because it will often be found that the uses to which the machine is to be put are such that features should be embodied therein which are not necessarily found incorporated in what are commonly called standard machines. Manufacturers, of course, discourage specifying anything except standard machines, especially their own standards,

because, from their point of view, this is the best business policy. The prospective purchaser is always told of the large extra cost which will be involved in making changes and of the delay in delivery which will be entailed thereby. These arguments should, of course, be given careful consideration, but they are not serious objections, provided some special feature can be obtained in the machine which will improve its efficiency for the particular purpose which it is to serve.

If the cost of a certain standard machine is $3000, and if improvements in the machine should happen to bring the cost up to $6000, the shop would still break more than even, if the changes made effected a saving in direct labor cost of $1 a day. Changes from the standard design to the extent of doubling the price of a machine would be most unusual, but a saving of $1 a day in wages due to an improvement in a machine is not at all uncommon.

Not long ago a wood-working shop was in the market for an additional railway cut-off saw. The saw disc of this type of machine is made to reciprocate backward and forward by means of a foot treadle. The shop referred to manufactures a class of furniture which involves cutting up boards to certain standard lengths in large quantities. The superintendent of the shop conceived the idea of an automatically reciprocating saw so as to relieve the operator of the work and time consumed in depressing the foot treadle for each cut. Inquiry was made of practically all wood-working machine builders, who manufacture cut-off saws, as to whether an automatically reciprocating saw could be furnished. The salesmen of the various firms were, as usual, eloquent in praise of their standard machines, but none were particularly encouraging about the automatic feature. A progressive builder finally agreed to work out the problem, with the result that the improvement was incorporated in the machine at an additional cost of $50. The output of the automatically reciprocating machine is fully 25 per cent greater than that of the standard type of railway cut-off saw. The liability of accident to the operator has also been much decreased, because in depressing the foot treadle of the old type, the operator is always thrown slightly off his balance, which is frequently the cause of maimed hands. This example is illustrative of the natural disinclination of machine builders to depart from their standard designs and of the great saving that can be effected in cost of production by purchasing

equipment to suit the shop needs. With the ever-increasing advance in wages, it is especially important that any new machines which are purchased shall effect savings in labor cost if possible.

Those who make requisitions for machines should, of course, make certain that the special features which they may specify will be of real use. Mere fads are expensive. By having a substantial mass of machine processing data on hand, such as described above, the danger of going wrong in this direction is much reduced. It is always worth while to look into the possibilities of having improvements made in most purchases that are contemplated. This does not mean that the purchaser need in any way work out the details of an improvement. His function should be to present to the machine builder the problem which is to be solved and, possibly, to suggest alterations in the standard machine which may bring about a solution of the problem. The suggestions for the big improvements made in machine tools in the past have usually come from the user, although the manufacturer has generally worked out the mechanical details of the improvements.

The chances are that for at least nine out of ten purchases a machine can be found which is a standard product of some manufacturer and which will meet the requirements of the shop. The time spent investigating the subject is, however, well spent if it leads to the purchase of an improved machine in the tenth case.

DRIVE

Practically all new machines purchased for navy yards at the present time are individually motor driven. The advantages of individual motor drive are too well known to need recapitulation. In fact, individual motor drive has become so popular that there is more likelihood that the purchaser will adopt that form of drive, even in cases where belt drive would be a more suitable choice, rather than the opposite. For a shop which is equipped with some line shafting for driving groups of machines, it is generally of advantage to purchase a belt-driven machine if it can be logically fitted into one of the groups.

The features to be decided upon in specifying individual drive are the kind of motor, whether alternating current or direct current; the type of motor; the controlling appliances, and the speed ratio in case a constant speed motor will not serve the purpose. Those having to do with the production and distribution of power

at navy yards are naturally in favor of installing alternating current motors for all purposes, because the losses of transforming from alternating current to direct current are thereby avoided.

Adjustable speed for alternating current motors is being rapidly developed. For many machines which formerly could be driven satisfactorily only by direct current motors, alternating current motors are now quite practicable. Nevertheless, the direct current motor is still far superior to the other for fine speed adjustments and for large ranges of speed. A decision as to which kind of current to specify should not be made until the question of the speed variation needed has been thoroughly investigated. For many machines, such as lathes, boring mills, planers, etc., wide ranges of speed are essential, if the removal of metal under all conditions is to be accomplished efficiently.

The speed adjustments of the motor, taken in conjunction with the gear ratio of the machine, should be such as to provide machine speeds of geometric progression. Designers of tools are only just beginning to appreciate the value of speed changes for metal-working machines which progress in this ratio. There is no difficulty in obtaining speed progressions which are in geometric ratio, even on standard machines which may perhaps not have been originally designed with this in view.

It is still the standard practice of manufacturers to equip certain kinds of machines with constant speed motors which should have some speed adjustment. Plate-punching machinery is a good example of this fallacious practice. It is not economical to install a large enough variety of sizes of punching machines in a jobbing shop to suit exactly every thickness of plate that is likely to be fabricated. Machines of such capacity that they will punch the thickest plates must, however, be installed. These heavy machines are necessarily of slower speed than lighter machines. Frequently they have to be used on light plates when there is a rush of work and the smaller machines are busy. For this lighter work the slow speed of the larger machines is no longer commensurate with the rate at which a light plate can be shifted along from hole to hole, thus entailing a reduction in output as compared to what might be accomplished on a lighter and faster machine. The remedy is to equip the heavy machine—and for that matter even machines of medium capacity—with multi-speed motors so that the rate of punching may be regulated to the thickness of the

plates being fabricated. The speed control best adapted to the machine should therefore be carefully considered, no matter what the standard practice of machine builders may be.

The question of whether the motor should be direct coupled, belted, or driven by chain should also be investigated. A very appreciable advantage in the location of the motor, with respect to the machine, can often be gained by providing chain drive as against belt drive, although the former may in some cases prove more expensive. This is especially true of machines running at high speeds. A belted motor must often be set so far away from a machine of this type in order to insure good belt efficiency, that it encroaches seriously on the working space around the tool. By adopting chain drive a much more compact arrangement is possible. The direct coupled, or geared motor gives an even more compact layout, but is not practicable in all cases.

ELECTRICAL EQUIPMENT

The standard Navy Department specifications for electric motors for operating navy yard machinery are so complete that those who write requisitions for shop machinery will find it easy to specify the most suitable equipment by making a careful study of the specifications. The only matters requiring judgment on the part of the purchaser are the correct selection of type and class for the motors. The type of motor is determined by considerations of the exposure which the motor will receive in service. The enclosed, dust-proof motor is the one which will meet practically all navy yard shop requirements, as it offers sufficient protection to the rotating parts against mechanical injury and dirt without being as expensive as the fully enclosed motor. The latter type need be specified only where the installation will be exposed to the weather.

The standard specifications cover also four classes of motors—the class being determined by the continuity of service of the motor and the question of whether it is to be constant speed or multi-speed. The definition of the various classes is fully set forth in the specifications, together with examples to guide the purchaser in making a correct selection.

EQUIPMENT

It is the usual experience of those who purchase machine tools for the first time that they find themselves with deliveries on their hands which are incomplete in various items of equipment, or accessories essential to the operation of the machines. Further requisitions must then be made before the machines can be put to all the uses for which they were intended. Manufacturers in bidding on government specifications naturally restrict their offers to only just what is called for by the specifications, because of the close competition on government business. The equipment and accessories needed should, therefore, be carefully investigated and enumerated explicitly in the specifications. This not only so as to avoid the delay of making additional requisitions, but, also, because such parts can be obtained at a much lower cost if they are included in the purchase of the original machine than if purchased later on, perhaps necessarily without competition, from the manufacturer of the machine. All necessary internal belting to drive the machine should also be called for. It is probable that much of the equipment, if specified with the machine, costs the government practically nothing as compared to the price that must be paid for it if purchased later on, because competition among bidders on the machine itself is likely to iron out the cost of these items.

PLANS, ASSEMBLY DATA, AND OPERATING INSTRUCTIONS

Very few American machine manufacturers furnish so much as a floor plan with their machines unless they are specially called on to do so. A plan of the machine showing the exact location of holding-down bolts and all projections and extensions below the floor line is of the greatest value to the purchaser in preparing the foundation for the machine. Such a plan, or at least a pencil sketch, must eventually be made before the foundation can be laid out and the holding-down bolts located. The manufacturer has in his files all the data necessary for making the plan. He can, therefore, provide it cheaply and quickly, whereas the purchaser may have to go to some expense and certainly considerable trouble to make the plan. Furthermore, unless a plan is furnished by the manufacturer, no work can be done on the foundation layout until the machine has been delivered, unboxed, and partly assembled, thus causing delay and unnecessary installation expense.

Assembly data are of equal value to the purchaser. Such data should consist of photographs or cuts of the completely assembled machine, or, better still, of the machine in several stages of assembly. A page or two of instructions to the erector are also of great help. If such data are not furnished, the erector must get the machine together by the fit-and-try method.

Operating instructions are, in the case of many machines, such as standard lathes, wood-working machines of the ordinary type, etc., not of very great importance, as there are always mechanics on hand who are familiar with the running of such machines. Nevertheless, a large number of the new machines installed in any shop have special adjustments and requirements as to setting cutters, fixtures, etc., about which the average mechanic or foreman is often not informed. The manufacturer is always in a position to know what operating instructions will be of value to the purchaser. A description of the adjustments of the machine, even if they are obvious, can do no harm.

The specifications should call for these data. They can all be furnished readily by the manufacturer and will not increase the cost of the machine in the slightest. Foreign machine builders are much more painstaking in these matters, no doubt because their export business has proven the value of serving their customers in this manner. Such data make it possible to place the machine in service more quickly and cheaply. The chances of damaging the machine, due to ignorance of its adjustments when it is first placed in operation, are also minimized by instructions of this kind.

LAYING OUT MACHINE FOUNDATIONS

Textbooks and handbooks contain very little information on the subject of laying out and building foundations for machines. A brief description of the procedure which should be followed after the machine has been delivered may, therefore, be of interest.

The first step in preparing for the installation of a machine is to make a new cardboard templet of the actual purchase to the scale of the shop plan. This templet may be made from the foundation plan furnished by the builder, or the dimensions may be taken directly from the machine, if it has been delivered. It is always safest to check the builder's plan with the actual delivery, as it has been the writer's experience with many hundreds of

machine installations that only about one plan in five is correct in all details. The location of the foundation bolt holes in the base casting should, by all means, be checked before placing the bolts, rather than trusting to the correctness of any plan that may be furnished.

More often than not the machine must be shifted a few inches, sometimes several feet, from the preliminary location, because the machine purchased is perhaps not of the same make as the one used for a guide in preparing the original layout plan. The location of the machine having been fixed, the entire job of installing the machine should next be planned. Written instructions should be furnished each foreman for his part of the work. A typical instruction sheet is given in Fig. 3. Each foreman having work to do is furnished a copy of the instructions so that he may know not only what work he is to do, but so that he may also know how his work fits in with that of the other foremen. These written instructions, together with the foundation plan, eliminate the uncertainty of having verbal directions carried out correctly.

Formerly it was the practice to lay out all foundations, whether for machines or for structures, by means of a tape line and the carpenter's level. A transit instrument and a surveyor's level are, however, far superior to the carpenter's level for this purpose, both in accuracy and in speed. It is not necessary to employ a skilled instrument man especially for this part of the job, because the Public Works Department at navy yards can always furnish such a man for the hour or two at a time that he may be needed. Even if an instrument man is not available, but the instruments are on hand, this is still the best way of laying out foundations if there are a number involved, because any mechanic or draftsman can readily be taught the use of a transit and a level sufficiently well for this purpose.

The transit, with the help of the steel tape, is used for placing the foundation stakes in their correct locations in the horizontal plane of the shop. With one setting of the tripod, stakes can be placed locating lines at right angles to each other running through the foundation, or defining two sides of the form. The two stakes defining the first line may both be located beyond the instrument, or the telescope may be swung 180° in azimuth, or through a vertical circle, so that the second stake will define the line extended

NAVAL STATION, PEARL HARBOR, T. H.

TO

ROUTE SHEET

DATE 2-8-15.

J. O. 15-R-359.	BRIEF OF JOB
PLAN NO Builder's Plan.	Install in main bay of Machine Shop one 18" Crank Slotter. Class No. 234 Contract 19135
DATE TO START	
DATE TO COMPLETE	APPROVED / COMPLETED

FOREMAN	SECTION	DATE TO COMPLETE
Mr. Wilkins:	Stake out for excavation of machine, in accordance with pencil sketch attached.	2-9-15
Mr. McComb:	Excavate for foundation to a depth of 25 inches below floor elevation, as given by grade stakes. Draw from store material called for on stub No. 4390 attached. The 18' pcs. are for sides and the 16' pcs. for the ends of the form. Build form as shown on contractor's plan No. 20768. Note changed dimensions in red. Shear 6 anchor plates 5"x5"x3/8". Punch 1-1/16" hole in center. Cut 6 pcs. of 3" tubing 19-7/8" long. Deliver to Mr. McKeown the 6 3/4" bolts covered by the stub, for threading.	2-20-15
Mr. McKeown:	Thread 6 3/4" bolts for 3 diameters from end. Return to Mr. McComb.	2-20-15
Mr. McComb:	Place form in excavation, setting 1" below floor grade. Set bolts in accordance with plan.	2-23-15
Mr. Wilkins:	Check setting of form 1" below floor grade.	2-23-15
Mr. McComb:	Pour concrete in accordance with instructions on Job Order No. 15-R-155. Charge concreting to J. O. 15-R-155.	2-24-15
	Remove forms.	3-15-15
	Set machine on foundation and level to floor elevation. Use shims and wedges from stock. Supported points to be not more than 2 ft. apart.	3-15-15
	(Additional sheets for assembling, electric work, etc.)	

SHEETS, SHEET NO.

FIG. 3

through the instrument. In order to set stakes at right angles to this line, it is only necessary to rotate the telescope in azimuth through 90°.

For obtaining the grade, a surveyor's level is set up near the transit instrument, and after the stakes have been placed by the use of the latter, they are driven so that the top is one foot (or some other uniform height) about the floor elevation. The chosen elevation is transferred from the benchmark or from the nearest reference elevation, painted or prick-punched on the structure of the building. The surveyor's level cannot be used conveniently for locating the stakes in the horizontal plane, because the telescope is not mounted on trunnions and cannot, therefore, be pointed downward to obtain a sight on a stake in the ground. On the other hand, the transit is not reliable for setting the stakes to grade, because the telescope is apt to slip in the trunnions, which may result in the transfer of an incorrect elevation from the benchmark.

If a large number of machines are to be installed in a shop, it pays to have the instrument man, preparatory to the actual layout work, place painted reference lines, either the actual floor level or some uniform elevation—six inches or a foot—above the floor, on every other column of the building, or at other convenient points of the structure. No matter in what part of the shop a foundation is being staked out, the instrument man will then always have a conveniently located reference elevation to work from.

Only the grade stakes—these being the stakes to which the depth of the excavation is referred—and the stakes defining the limits of the excavation should be driven to begin with if the foundation is large and complicated. After the excavation has been completed, the instrument man returns to place the stakes for stretching the lines defining the form work and the stakes for the center lines for the holding-down bolts. Reference elevations are marked on the latter stakes, or the top of the stake itself is made the datum point, so that the carpenter may build the form and set the bolts to the desired height as directed in the instruction sheets.

If in the case of large foundations all of the stakes needed to install the machine are placed before ground is broken, some of them are certain to be disturbed in handling the excavated material —necessitating a return of the instrument man anyway. Extensive

excavation work can also be done much more expeditiously if it is unhampered by the presence of too many stakes near the hole. In the case of small, rectangular foundations, it is practicable to place all of the stakes at once without much danger of their being disturbed.

If an entire shop is being equipped, the work can be done most economically by fixing on a program which has as its basis the installation of machines by groups. The number of machines in each group should be such that the total cubic yardage of concrete in the foundations of the groups will make at least an eight-hour run for the concrete mixer. This unit is chosen because it is uneconomical to move, set up, and operate a concrete mixer for less than a full day's run. For a one-half cubic-yard mixer, 75 cubic yards in eight hours is a good day's work on machine foundations of average size, where no single foundation contains more than five or six cubic yards of material. In addition to the economy of pouring concrete by groups, there are other advantages in this procedure. This method of laying out the work makes it possible to keep the various gangs of workmen continuously employed—laborers, form carpenters, erecting machinists, etc. While the laborers are excavating for one group, the carpenters are building the forms for the preceding group. When the forms have been completed for the latter, the laborers' gang is taken off excavation work for the day or two necessary to pour concrete—the carpenters in the meantime proceeding with the forms for the next group. The machinists follow up the concreting gang, and so on. A further advantage in grouping the machines, instead of doing all of the digging first and then following with the other operations, is that the entire shop floor is not cut up at one time by excavations. The unbroken areas of the floor are thus left available for the temporary storage of delivered machines and for the location of the concrete mixer. Storage room is also left available near the mixer for sand, stone, and cement. Part of the dirt from one set of excavations can be used as backfill for previous groups. A further consideration in favor of not doing all of the digging first is that some of the excavations will have to be left open an appreciable length of time, if the latter procedure is followed, resulting in crumbling and sliding in of the sides.

It is always well to have the operations of staking out, excavating, form building, bolt setting, and concreting follow one another

as speedily as possible because of the liability of stakes, forms, bolts, etc., to disturbance by the workmen in the shop if they are left exposed too long.

Although the above procedure is more particularly applicable to a large equipment undertaking, such as fitting out a number of new shops, it is, nevertheless, well worth following in the case of projects of smaller scope.

DEPTH OF FOUNDATIONS

The above description and what follows cover only concrete foundations, because practically no other kind are built for navy yard machinery. Only a few navy yard buildings have more than one floor. For ground floor work a concrete foundation is the cheapest and best. The exact depth of concrete necessary for a given machine cannot be prescribed except by taking into account local conditions. The considerations which determine the depth will be briefly given:

(a) The foundation must not crack under the weight of the machine and its load. This may not, however, provide a sufficiently thick slab to meet certain additional requirements.

(b) The foundation must not settle. Often, by excavating an additional foot or two, a compact stratum of earth can be reached which will insure freedom from settling. Even though this may involve several extra cubic yards of concrete, the insurance is worth the additional cost. In the case of large boring mills, planers, lathes, etc., the possible weight of the piece being processed, as well as the weight of the machine and its foundation, must be taken into consideration in calculating the load to which the soil will be subjected. Very few shop machines weigh so much as to approach the limit of bearing power of the ground on which they have to be installed. A weight of 1000 pounds per square foot is somewhat above the average for machine installations. Even filled land, if it has had a few years to settle, will carry this load. A rough rule for estimating the bearing power of soil is that if a man of average weight does not sink into the ground when standing on his heels, it has a bearing power of at least 1000 pounds per square foot. If the bearing power of the soil is doubtful, it is well to subject it to a test load. The pressure per square foot can be reduced by spreading the footing of the

foundation. The footing should, of course, be offset so as to save weight of concrete.

(c) In order to fully develop the strength of holding-down bolts embedded in concrete, they should have a length equal to about 30 diameters. This requirement is often the factor governing the depth of the foundation. Bolts considerably shorter can safely be used for machines which are not subject to shock or vibration in service. The manufacturer's recommendation as to the proper diameter of bolts to use should be taken, as his experience with the machine is a better guide in this respect than any calculation of

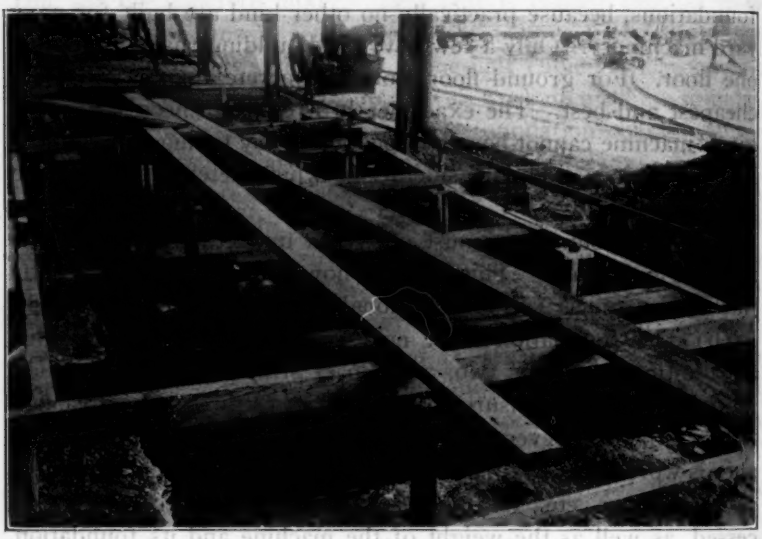


FIG. 4

the stresses which the bolts will have to carry due to belt pull, vibration and shock, or to considerations of keeping proper alignment. In the case of a few kinds of individually-driven machines where the motor is mounted upon the machine bed plate or on the machine housing, no holding-down bolts are necessary. The manufacturer's recommendations will be found to govern such cases.

(d) The foundation should be sufficiently heavy to provide the necessary inertia for absorbing the stresses set up by the shock or vibration of the running machine. This is an important consideration in the case of only a few navy yard shop machines, such as punches, presses, hammers, and heavy rolls.

(e) By the use of steel reinforcing rods, the thickness of the slab for very heavy machines can sometimes be reduced. The cut in Fig. 4 shows steel reinforcing rods in place in the excavation for a set of heavy, plate-bending rolls. The shop in which the machine is installed is located on made land which is somewhat low in bearing power. It was, therefore, particularly advisable to guard against settling of the machine, and, hence, cracking of the foundation. Thickening the slab would have made matters worse, as it would have added to the already heavy load per square foot. By reinforcing the bottom with ⅞-inch square steel rods, spaced nine inches apart, the foundation as a whole must settle, if at all, which is not likely because of its large area, viz., 350 square feet. The load per square foot on the soil in the case of this machine is 1100 pounds. Reinforcing rods should be placed three inches above the bottom of the excavation. This insures their being embedded thoroughly in the concrete and still places them so far from the neutral axis of the slab that the strength of the rods is fully developed in resisting tension stresses.

FOUNDATION FORMS

The excavation for the foundation should be made about a foot larger on each side than is necessary to accommodate the form, so that the construction of the latter will not be hampered and so that it may be readily braced. If the foundation is small and rectangular in shape, the form can be most economically built on top of the ground and then placed in the excavation. Large and complicated forms can be more economically built directly in place. The top of the form should be located one inch below the bearing surface of the machine base. Experience shows that an allowance of one inch for wedging, in order to set the machine level, is the most satisfactory. The space between the bottom of the machine and the top of the foundation is filled later on with cement mortar. For light machines where irregularities in the base casting are not likely to be encountered, an allowance of less than one inch for leveling would give satisfactory results, but a space of as much as one inch is necessary anyway, for grouting. Cement mortar, if applied in a thinner layer, cracks and does not bond well with the concrete foundation.

Rough 1-inch boards of the cheapest grade in stock will answer for practically all form work. Merchantable Douglas fir on the

West coast, and short-leaf yellow pine on the East coast, are usually the cheapest grades of lumber carried at navy yards and are sufficiently good for this purpose. It seldom pays to use form lumber a second time, because the labor cost of salvaging used boards is generally higher than the cost of new lumber. The relative cost of labor and material will, however, determine this point. With lumber costing $16 a thousand and common labor $2 a day, there is no economy in salvaging old lumber for re-use on form work.

Just before pouring the concrete, the inside of the form should

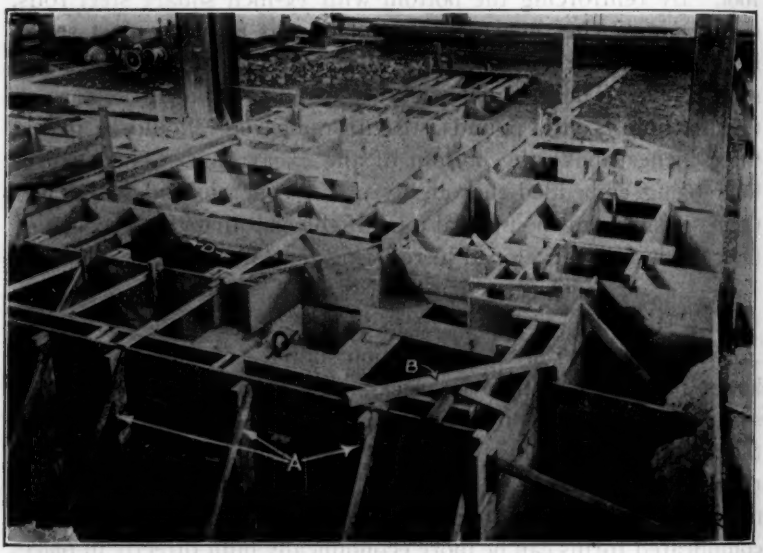


FIG. 5

be given an application of crude oil. This may darken the concrete, but discoloration is not objectionable in the case of foundations. Form oil is generally used for exposed concrete, but is unnecessarily expensive for foundation work. The object of the coating of oil for this class of work is not so much to give the concrete a smooth finish, as it is to facilitate stripping the form after the concrete has set. Often it is not essential to remove more than the top course of the form as the lower portion will be covered by the backfill. If there is a considerable amount of bracing and other lumber in the form, it should, however, be removed entirely, otherwise when it decays the floor will settle around the foundation.

The forms should be well braced, wired and cleated so as to prevent spreading when the concrete is poured. Fig. 5 shows a typical form. Cleats (*A*) should be provided about every 18 inches, and should be braced to the sides of the excavation. Corner cleats (*B*) keep the form from racking, and distance-pieces prevent spreading. The wires *D* also prevent spreading and are especially important for wide box sections. Even small rectangular forms should be wired and braced. Soft, No. 12 gauge wire is found the most satisfactory for the general run of work. After the wire has been laced through the holes in the boards on opposite sides of the form, the parallel strands are twisted together until the slack has been taken up and the twisted wire is under strain.

Bracing the form adequately is highly important, because if it should spread under the pressure of the wet concrete, the foundation bolts are almost certain to be thrown out of position. If this happens to any appreciable extent, most of the work up to that point becomes a total loss. Concrete sets so quickly that much of it may harden, if the foundation is large, before it can be shoveled out preparatory to resetting the bolts and bringing the form back to shape.

FOUNDATION BOLTS

Foundation bolts for structural columns and some other classes of work are usually embedded directly in the concrete. This procedure is not, however, to be recommended for machine foundations, because the bolts are comparatively far apart and often do not lie in straight lines. If any one of the bolts in a foundation should happen to be set so much as a quarter of an inch out of its correct location, it would not come fair with the corresponding hole in the base of the machine. This would make it necessary to ream or chip out the hole in the machine casting, besides being objectionable for other reasons. To set the bolts with such precision that there would be no chance of even such slight deviations would be very expensive as it would necessitate making a templet of the bottom of the machine.

The most satisfactory and most economical way of setting the bolts is to encase them in sleeves as shown at *A*, Fig. 6. The concrete is kept out of the sleeves by the anchor plates *B*. The bolt is thus fixed only at the head and can be forced sideways to a considerable extent if necessary to bring it fair with the hole

in the machine base, should the setting happen to be slightly off. When grouting under the machine, the sleeves are filled up, which results in embedding the bolts throughout their length as completely as though they had been set in concrete in the first place. The sleeve serves a further purpose in that it forms a distance-piece between the head of the bolt and the bottom of the holding strip *C*, shown in Fig. 6. By setting up on the nut the bolt is drawn up snugly and must remain in a vertical position while the concrete is being poured.

FIG. 6

Sleeves cut from old boiler tubes or scrapped pipe, of which any quantity can usually be found at a navy yard, answer the purpose as well as sleeves made from new pipes. For bolts ¾ inch and less in diameter, 2-inch boiler tubes are large enough. For bolts over ¾ inch in diameter, it is preferable to use 3-inch tubes, if available. The anchor plates, *B*, Fig. 6, may also be cut from old material taken from scrap. The shape, size and thickness are of no particular importance so long as the plates serve as efficient washers to keep the concrete out of the sleeves, and are large enough to form a collar, which, when embedded in the foundation, helps to anchor the bolts. Plates five inches square, cut from ¼-inch or ⅜-inch material, are ordinarily used.

The amount of projection of the point of the bolt above the form should be one inch (the amount allowed for grouting), plus the depth of the hole in the base of the machine through which it passes, plus the thickness of the nut, plus ½ inch for leeway. Hexagonal, chamfered nuts should be used, because the bolt holes are frequently located in flanges and lugs forming part of the base casting of the machine. When so located, it is difficult to set up a square nut, because the jaws of the wrench foul the machine casting.

CONCRETE MIXTURE

The most suitable size of crushed stone to use for the general run of foundations is No. 2—that is, stone which will just pass through a 2-inch ring. The proportions of cement, sand, and stone should be 1 : 3 : 6, by volume, respectively. For reinforced work, 1-inch stone is preferable, as it insures a closer bond with the steel rods. The proportions for this purpose should be 1 cement, 2 sand, and 4 stone.

Pits for the counterweights of large planers, for step bearings for pillar cranes, for crucible brass furnaces and for other similar equipment must often be made watertight. The ordinary mixture of concrete does not insure watertightness. If, however, the proportions are made 1 cement, 2 sand, and 4 stone (using 1-inch stone preferably), with the addition of 10 per cent, by volume, of hydrated lime, a good watertight job can be made. The walls of such pits should, however, be at least a foot thick, if the foundation is of any depth at all. Foundations for shop machinery which extend as much as 10 feet below the water-line are unusual. Anything up to this depth can be made watertight by the method mentioned.

Concrete should, in all cases, be mixed quite wet so that it can be puddled readily into the corners of the form and around the holding-down bolts. A wet mixture facilitates, also, finishing off the top with reasonable evenness.

In order to relieve the foreman of the necessity of calculating the proportions in case changes are made for special work, such as for reinforced foundations, watertight work, etc., it is best to give him definite instructions as to the number of wheelbarrows of sand and stone and the number of bags of cement to use for a charge of the mixer.

SETTING MACHINES

If a foundation is large and the machine which it has to carry is heavy, the concrete should be allowed to set at least three weeks before the forms are stripped and the machine is placed. Steam-hammer and pillar-crane foundations should be allowed to age even longer before they are placed in service, because they are heavily stressed when the equipment is used. For small foundations carrying light loads, a week or 10 days is enough time to allow for setting, although it is always better to give concrete an excess of time for hardening, if practicable. Tests show that concrete does not reach its ultimate hardness and strength for fully six months after it has been poured.

The machine is leveled up by means of steel wedges. These should be made in quantities on a helve hammer if a considerable installation program is being carried out. Wedges and shims should be placed at least every two feet all the way around the machine. The grouting cannot be counted on to carry much of the weight, because it shrinks slightly on setting. The most satisfactory precedure in leveling up the machine is to set up first the wedges at the four corners, or at the dividing sections of the machine, if the casting is made in several pieces, and then to place the additional shims between the leveling wedges so as to provide a support every 18 inches or two feet, as mentioned. Scrap material is sufficiently good for making the shims and wedges. A supply of various thicknesses should be made up before the erector begins setting the machine.

GROUTING

The machine having been leveled and the bolts having been set up firmly, its elevation should again be checked. If the machine is large and depends for its proper functioning on exact alignment, the elevation at various points should be taken with a surveyor's level. This is particularly important in the case of planers, large and heavy lathes, horizontal boring machines, etc. A simple form is then secured around the foundation to keep the cement mortar from running off. The cement mortar is made of one part sand and one part cement. The sleeves for the foundation bolts should be completely filled with mortar during this process. The top of the foundation is finally finished off to floor elevation with the edges slightly beveled.

ELECTRIC WIRING

The last step in equipping a new shop is to connect up the machines to the power panel, in case they are individually driven as most navy yard machines now are. The main panel should be as near the center of electrical distribution of the shop as practicable. This point need, of course, be only approximately determined, bearing in mind the location of the larger and more actively used machines.

The capacity of the feeder supplying power to the bus bars of the main panel need not be equal to the aggregate amperage of all of the motors in the shop. It would be a most unusual occurrence for all of the motors in any shop to be running at their maximum horse-power simultaneously. Even if this should happen for a moment, it would not be of sufficient duration to develop the full heating effect of the current. The capacity of the main feeder should be based on a reasonable assumption as to the conditions under which the shops will operate, having due regard also for possible future expansion. For most shops it is necessary to start with a fixed load, because certain machines must always be in operation when the shop is running. To this constant load a percentage of the remaining motor capacity is added, based on an assumption of the probable shop activity.

For example: In the case of a wood-working shop the motors driving the shaving exhausters must be running if any machine in the shop is in use. The load on these motors must, therefore, be taken as the first item in arriving at the feeder capacity. Then, also, there are in any wood-working shop two or three machines of large horse-power as compared to the remaining machines. It is necessary to provide enough feeder capacity to run at least two of these large machines and the shaving exhausters simultaneously. To the load thus obtained, a percentage of the remaining load is then added. The determination of the feeder capacity for each shop must be made a separate study. A shop in which the predominant motor installation is on cranes can be served by a much smaller feeder than if the same motors were installed on continuously running machinery. Crane loads are momentary and have only a slight heating effect on the conductors as compared to the continuous load of constantly running machines.

From the main panel, feeders are run to auxiliary distribution panels in various parts of the shop. The machines are then wired

to the auxiliary panels. Spare taps should always be provided on the main panel, as well as on the auxiliary panels, for future additions to the shop.

Each feeder on the distribution panel should have a switch and should be fused, even though the individual motors are protected by overload devices, because the latter do not protect the line in case of grounds.

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U. S. NAVAL INSTITUTE, ANNAPOLIS, MD.

CHEER UP!!

THERE IS NO NAVAL WAR COLLEGE

By CAPTAIN WM. S. SIMS, U. S. Navy

In the January-February, 1916, number of the NAVAL INSTITUTE PROCEEDINGS Lieutenant Farley has published an article entitled "The Sea Going Officer and the War College." In this article the author makes it plain that he is a thorough and enthusiastic advocate of the college, and that he deplores the failure of many officers to understand its vital importance to the efficient conduct of our fleet.

But as his summarized quotations of the criticisms of these officers indicates an apparently complete misapprehension on their part of the real nature of the college, I shall endeavor to show that the college as now conducted is at all times essentially a part of the fleet, and that its methods are largely controlled by the fleet.

There is a granite building on Coasters Harbor Island in which are now assembled about forty officers, almost all directly from the fleet or recently in the fleet, for the purpose of determining from their practical fleet experience, and from the accepted principles of warfare, the best practical methods of handling our fleet in the face of an enemy. These methods involve tactics and strategy (the definitions of these terms may be found in any dictionary).

There is no War College, as the term "college" is usually understood. There is no president or corps of professors who remain during life and good behavior and whose duty it is to impose their conclusions upon the pupils.

The assemblage of officers is practically a board convened each year for the purpose of determining the best manner of conducting naval warfare with vessels and weapons of ever-changing characteristics. The staff of the college, generally fresh from the fleet

and a course at the college, presents the accepted principles of war, and the accepted manner of writing orders, issues the rules of the war games to be played, and helps the pupils play them.

The principles and the order forms are derived from the acknowledged masters of the art, and the rules are formulated from the practical experience of the practical officers of the fleet.

The pupils are assigned problems, the correct solutions of which involve a correct application of the principles, and those who apply themselves leave the college with a very valuable practical up-to-date knowledge of the best practical method of conducting war on the sea.

At the end of the course of one year, the practical officers from the fleet who are about to be graduated, and the staff of the college, meet practically as a board to discuss the methods by which the studies of the college have been conducted during the past year, and to discuss changes in the course that may be deemed advisable for the following year.

In this manner, the method of conducting the college is virtually determined from year to year by the fleet, by the officer students and officers of the staff who have brought their practical experience from the fleet, and matured this experience by a year of study as to the most practical manner of handling the battle fleet.

From the graduating class are usually selected a number of officers to replace those members of the staff who are due to go back to the fleet for more practical experience, and to carry to the fleet the knowledge and experience they have gained by the study of the art of war.

The above to show that we have no Naval War College in the sense in which it seems to be understood by too many "practical" officers in the fleet, that is, as a sort of "high brow" institution that imposes its theoretical ideas upon the fleet in "words that had to be looked up in a dictionary."

In the past there was some excuse for such lamentable ignorance of the nature of the college (and of the dictionary words), but there is none whatever now.

When I went to the college in 1911 the service was very generally ignorant of its purposes and the great practical value of its teachings. Believing that this ignorance was extremely detrimental to our advancement in the practical methods of naval warfare, I wrote a pamphlet entitled "The Practical Character of the

Naval War College." I gave up a very considerable number of real dollars to have this printed and a copy sent to each line officer in the service at that time (November, 1912).

I do not think that any officer who read that pamphlet, and who now remembers it, would care to confess the ignorance indicated by the comments quoted by Lieutenant Farley. Unfortunately, the great majority did not read it. I questioned many officers and found few who had read it. Had they done so, and followed its advice as to the five or six books recommended as a beginning of a course of reading, they would not have had to confess that they needed a dictionary to tell them the meaning of the commonest terms of tactics, strategy, etc., used in articles issued by the college.

The explanation, therefore, of the criticisms of the fleet's own college, composed of fleet officers, is very simple. It is an exhibition of wholly unpardonable ignorance.

It should not be assumed, however, that these criticisms are as serious as reported. Many of them are doubtless idle exercises of amateur wardroom wit. It is quite a mistake to assume that responsible officers resent the statement that no officers should be ordered to important commands until after they had taken the course at the college. The responsible officers of the fleet have, on the contrary, deliberately expressed themselves on this subject.

Within the past two years, all division commanders, all commanding officers of the Atlantic fleet, and all members of the War College staff, were assembled at the college for the purpose of discussing the relations between the fleet and the college. After extended discussion the Secretary of the Navy, who presided, asked the opinion of each officer present upon this particular point, and without a single exception all agreed that as soon as practicable it should be the established practice to order to important commands, both ashore and afloat, only those officers who were graduates of the college.

The remedy for the conditions complained of is not believed to be any of those suggested. The fault is not with the college, for the college is such as the fleet officers make it and change it from year to year to suit the fleet's own practical requirements.

The remedy should be applied where Lieutenant Farley so clearly shows that it is needed, that is, in the fleet. If those officers of the fleet who understand the vital necessity of the college would take the trouble to explain it to those who cannot or will not read

the entirely adequate evidence on the subject, the difficulty would disappear.

It would of course be well if all officers could be sent to the college, but as this is manifestly entirely impracticable, the next best thing is to send as many as the conditions of the service will permit at the times when they are available.

This will provide a continuous flow of the famous practical experience from the fleet to the college, and a continuous flow back to the fleet of the same famous practical experience plus some knowledge of naval warfare—and the unfamiliar words associated therewith.

This process cannot, however, educate all the officers of the fleet in war knowledge. That is essentially the business of the fleet. The practical officers returning from the college to the fleet are just as capable of instructing the officers of the fleet as those who remain at the college to instruct those coming from the fleet. All that is required is the necessary organization to make the course in the fleet even more practical than that conducted at the college by the practical officers from the fleet.

This must be done before the fleet will be ready to carry out war operations with efficiency. It would do little good to pick out the ablest practical fleet officers and educate them alone in the art of war; for the ablest and most experienced leader can accomplish little with a commissioned personnel that does not understand the game—that would not even know what his orders meant if Webster's unabridged happened to be mislaid.

Let the fleet officers therefore cheer up, and instead of criticising their own fleet War College across the wardroom tables, get busy, read the books, take the correspondence course, get up chart maneuvers, and learn the great game the successful playing of which in war is their only reason for existence.

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U. S. NAVAL INSTITUTE, ANNAPOLIS, MD.

GUNBOATS

By Lieutenant John Stapler, U. S. Navy

The majority of the gunboats in commission today are rather ancient; their bulging sponsons and time-honored appearance give one a feeling of sympathy for those who must be aboard. There is no question, but that gunboat duty is none too attractive; and yet it is an important one, and one that has possibilities of development.

As a matter of fact such duty is good training for officers and men, provided that it is not carried to such lengths as to allow them to go stale. Work and meditation among the benighted and at the stepping off places, are splendid up to the point when the passing months develop into years. Then enthusiasm lags, and disgust creeps in to spoil it all; and many a good man leaves the service sore, just because the thing has been overdone, and he is unable to see the justice of it. A definite period should constitute such service. At the end of that time the individual should feel confident that he would be relieved.

To do this, it is not necessary for the vessel to be continually steaming to some United States port. Much better that she permanently keep her station in the area of operations, and that at regular intervals exchange drafts of officers and men be made. A higher condition of efficiency could be maintained by doing away altogether with the yearly overhaul period. Let the cruisers and gunboats dock at the base of the region in which they are working. To that end provide a floating dry dock for such a place as Guantanamo.

A repair ship on its rounds should be able to take care of minor troubles, and more extensive work could be handled at the base of operations. The ship's force to do all work, and the ship

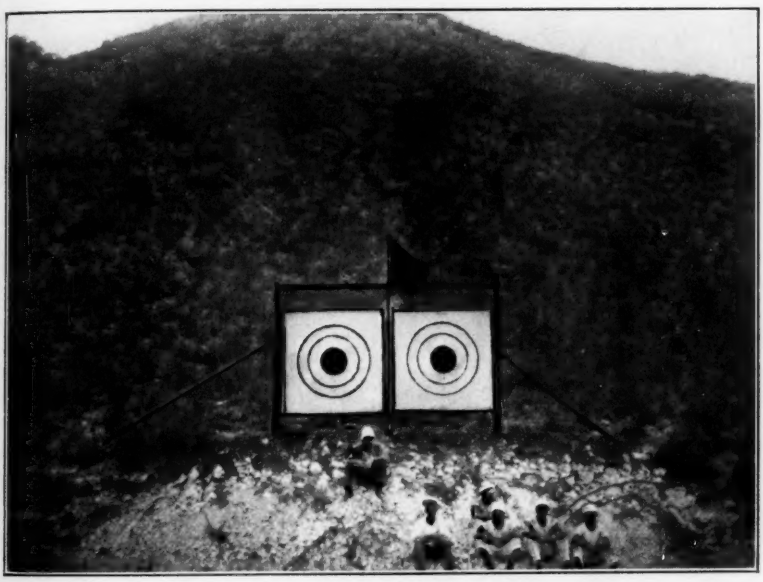
to rise or fall on the efficiency of that force. No better training for war could be had from the point of view of matériel and personnel. Avoid putting the ship out of commission and the long overhaul period. The more continually active a gunboat is, the more efficient she will be, and the less chance there is for deterioration, especially among the older ones. Retain the gunboats cruising, and keep fresh the personnel by gradual change in the complements. Things to be definite; so much service, and then a change. It is uncertainty and disappointment that causes trouble in the tropics, and hurts discipline. If system in the matter of reliefs will keep enthusiasm alive and make men content in the service—let us have it.

The number of men on a gunboat is comparatively small, but every man counts. Where it is a constant fight against deterioration, iron rust, old boilers and time honored machinery, good men mean a lot, and poor ones nothing at all. Only men with good records should be sent to gunboats; for nearly every man has an individual job and when he is a minus quantity, it is difficult to replace him. Drafts usually come, so many men from such and such a battleship; and a certain number from this or that training station. After a time it dawns, that the battleship kept the good ones. Under the circumstances this is not right. Ships that are about two hundred feet in length, and that at times patrol three or four months without giving liberty, need the men the battleship keeps.

From the point of view of developing the individual and finding out whether he is worth anything, the gunboat is an excellent test. A man that has it in him can advance more rapidly on a small ship than elsewhere, for he is always in sight, and his work is immediately felt.

The best way to be in the tropics is to be busy; not occupied continually with the same subject, but by various activities to avoid monotony. Plenty of exercise is necessary. The natives seem able to do without it, but they have a way of getting along without a good many things. The crew that is active during the entire day and is well fed, is bound to keep in shape. There is then no time for grumbling, and the heat among other things is not noticed. Time passes and before it is realized the day is finished. The whole thing is an attitude of mind which can be developed by being continually occupied, and so occupied that the interest is held.

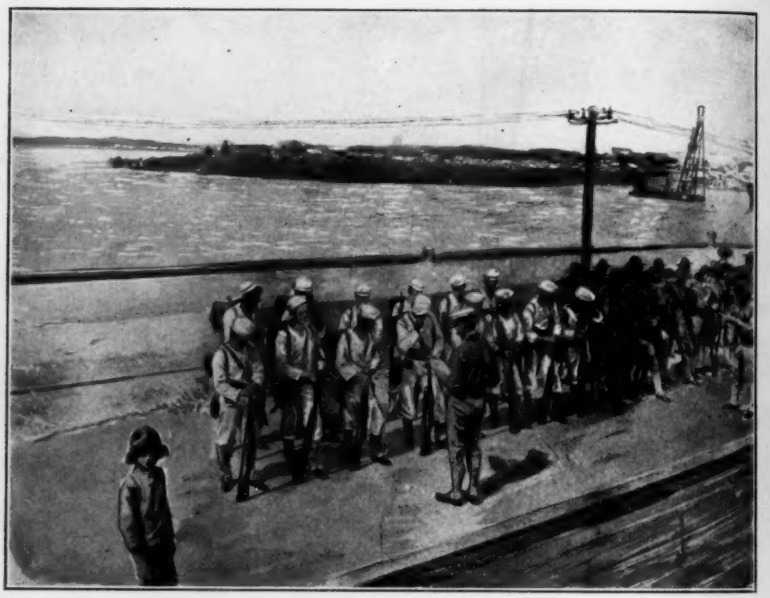
Let a drill be short and well done and follow it by a rest; then go ahead with another exercise or with the ship's work. It is a good plan to have a working party ashore at some job such as laying out a small arm target range, clearing a baseball field, building a landing or something of the sort. It gives the men a chance to stretch their legs and something new to do. The interest they take in such operations proves its value outside the return from the constructive nature of the work.



A GUNBOAT'S TARGETS

Small arm firing can be constantly going on, engineers and all. By posting scores and holding inter-division matches, it is surprising how much competition will develop, and what sport the qualification of marksmen and sharpshooters will become. The landing force of a gunboat should be made up of sharpshooters with a good number of expert riflemen among them. There is no reason why this cannot be the case if the firing is turned into a game, and intelligent individual coaching is carried out. When a gunboat leaves port, down come the target frames and supports to be stowed away until the next opportunity arrives. Then, on the strength of a little blasting powder for the pits, up they go again, out on a barren point or against some suitable hill.

Along with the rifle firing may go the machine gun practice, which is bound to grow in importance. When the signs are right, the three-inch field piece can have its turn before the local authorities become disturbed. It is good practice to have the landing force on the firing line with the field piece when firing shrapnel is in progress. In harbors where sufficient facilities for rifle practice are not at hand, pistol practice may be able to take its place. The main thing is to keep something of the sort going



A LANDING FORCE GOES ASHORE

continually, and have all hands become proficient in small arms. On such duty as gunboats are frequently doing, it means a good deal to have a straight shooting landing force, that can be landed in a few minutes, and is capable of meeting any situation that may be found. The force that can be put ashore from a gunboat is small, but that is all the more reason why it should be efficient. To accomplish this, small arm firing should be carried out at every opportunity.

Another form of instruction and exercise, that can well be taken up on board a gunboat, is swimming. Duty in tropical waters lends itself readily to this. All hands should be overboard at least once each day; while the non-swimmers can have their chance,

morning, noon and night. The men to swim by divisions, part of them to go in before breakfast, and part in the evening. Every now and then, it is a good plan to mark men for their ability in swimming, and so keep track of the progress they are making.

When starting a cruise, there will always be found a number of men who cannot swim, and who firmly believe they never will be able to do so. The best way to attack this point of view is to divide them into groups and assign an instructor to each group. At this stage, slings from a davit head, or the use of a life jacket

ON A HIKE

of reduced buoyancy may prove an aid. It will not be long before the spirit of competition will have its way, and some fine morning one of the incorrigibles, who swore he never could do it, will break away and go swimming around the ship on his back as "pleased as Punch." Not only should the crew be able to swim with breast and side stroke, to dive and float, but they should be taught rescue work, and how to handle such jobs as clearing a line from the propeller.

Let swimming be made an every day sport in which all hands are expected to take part. A stopper from a davit head with a bowline in it will act as a swing, or a spring board may be rigged that will be no end of fun until it is broken. Make a ball of some sort, and line up two divisions for water polo. A few months of this, will make the ship's company good swimmers.

Baseball is a sport that needs no urging. Inter-division games can be played whenever it is possible to get ashore to either find or make a field. If there are marines on the beach, so much the better. Frequent boat sailing will soon result in some pretty keen races. Every man in the crew to take the tiller at one time or another until he makes good. Men should be encouraged to prepare themselves along some line of advancement; and whenever possible vacancies in ratings to be filled from the best members of the crew. To be occupied at work or sport the day through,

A FORT SURRENDER

is the best plan for a gunboat in the tropics. To have something in hand, and to be busy in accomplishment is the answer to any cloud of depression that may threaten a ship.

Such a base as Guantanamo ought to be equipped with a moving picture exchange. A gunboat, of all vessels in the navy, needs to be provided with a moving picture machine as part of its equipment. The meaning of "Movies tonight?" cannot fully be appreciated until one has heard it after six months patrol in the West Indies.

Another element in a gunboat that could be broadened, is the ship's library. More of the circulating library idea should enter

into its management. There does not seem to be any reason why new books cannot be sent out now and then from some main distributing station such as New York, and old books returned. For that matter, an exchange system might be arranged between ships that are on the same station. To start out with a library and to cling to it for a year without making any change seems to be a

TYPES OF CHIEFS

short-sighted policy. Magazines and periodicals are frequently of the greatest interest, especially during such a time as the present European War. Would it not be possible to make some of the best ones part of the ship's library, and allow men to draw them out in heavy covers just as books are now obtained? Let the library then be open every night for the exchange of magazines and books.

Nearly every gunboat could be improved by having better washroom facilities and baths for the men. The ice machine is another

element that can be a great comfort, if it is of adequate power. Unfortunately most of the ice machines in gunboats are either old, or of insufficient capacity to do all the things the tropics demand of them. The cold storage must of course be first taken care of; then, as a usual thing, the scuttle butt comes in for a little cooling now and then, but as for making ice, it is out of the question. Hurried trips ashore in search of ice when one of the ship's company is fighting maleria and is suffering from a high fever, brings home the value of an ice machine that can make ice in addition to its other work. There is no place where a two ton ice machine could be installed to better advantage than on board a gunboat doing tropical duty. In this connection it may be noted that the air leads must be kept from the vicinity of the engine and boiler spaces, or the efficiency of the whole installation will suffer.

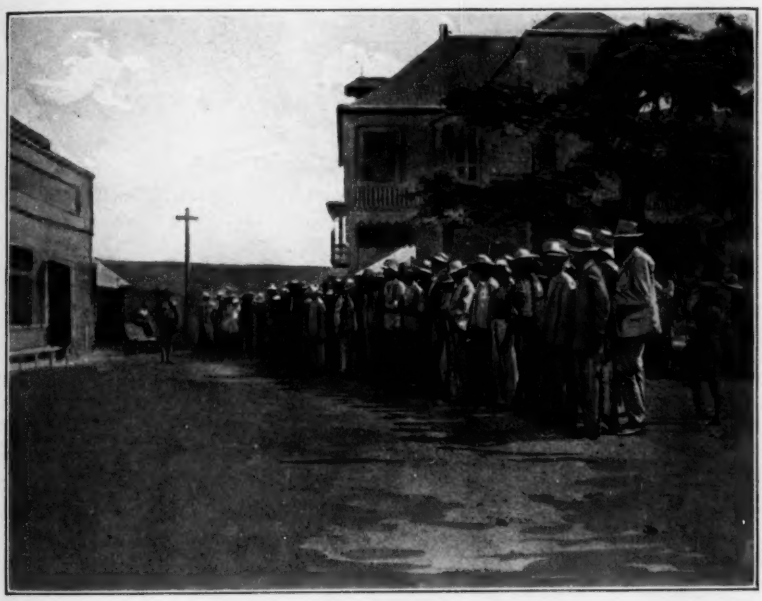
The boat equipment of many gunboats is behind the times. This is unfortunate, for efficient power boats add a great deal to the all around working ability of this type of vessel. It will be a happy day indeed when the decrepit little steam launches that once graced such ships as the *Chicago* and the *Atlanta* are gently laid away for something with a motor in it. The pulling cutters can disappear at the same time and never be missed. A thirty foot motor boat of about twelve knots speed; two thirty foot motor sailing launches and the usual whaleboats, dinghy, wherry and punts, should outfit a gunboat in boats to the best advantage.

The thirty foot motor boat, as compared to a thirty foot steam launch, is lighter, faster and more easily stowed, and lends itself readily to such duty as is required on tropical service. The two thirty foot motor sailing launches are considered necessary from every point of view. Such boats are well suited to rapid landing of the landing force, when it is necessary to throw it ashore in a hurry. They simplify the obtaining of stores from supply ships in the open sea. And when it comes to boating over long distances under a hot sun, they have the pulling cutters beaten a mile. They expedite work and save the personnel, two factors well worth while.

The three-inch limber is rarely if ever used with the field piece, and it is suggested that another field piece or light mountain gun of some sort be issued to gunboats to take its place. Slings or carriers could be designed for the transportation of spare ammunition by pack animal. The equipment of a gunboat could also be

improved by allowing four machine guns instead of two. The machine gun is an effective weapon, and every landing force ought to be well supplied with them. They have proved very valuable in patrolling towns, and are always treated by the natives with the greatest respect.

In future construction, the gunboat and mine layer might be combined in one type. The resulting vessel would be one of about 2400 tons displacement, with a length of 275 feet, a beam of 38 feet,

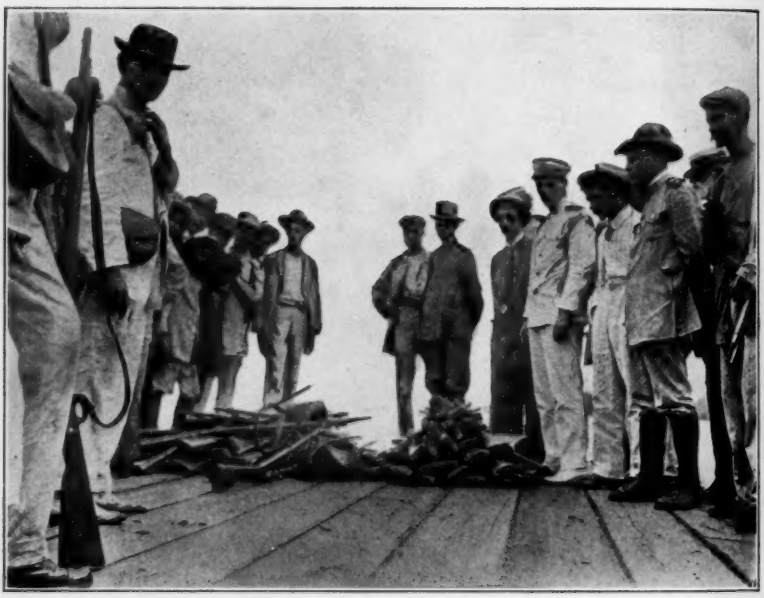


A DISTRICT TURNS IN ITS RIFLES

and a maximum draft not to exceed 16 feet. Oil burning boilers and electric propulsion to give a sustained speed of 20 knots. The general appearance would be that of a small scout cruiser with a stern of marked overhang to facilitate the depositing of mines. The officers quarters would be found forward.

Such a design might be called a mine gunboat. It would perform all the duties of patrol now done by the gunboat. In addition it would carry and lay mines, and be rigged to execute sweeping operations. A high powered radio outfit would give it additional value to the fleet for scouting purposes. During times of peace, it would be kept on patrol duty. On the outbreak of hos-

tilities it would be found following up its occupation of laying mines, either at an advanced base, or offensively in the neighborhood of the enemy fleet. When the fleet was on the move prior to an action, vessels of this type would be of value on outpost duty in the battleship screen and with destroyers prevent surprise day or night attack. The larger and faster scouts would be relieved then of the possible necessity of strengthening the destroyer screen, and could be employed with the battle cruisers to find the enemy main body.



THE COLLECTING OF ARMS

The experiences of the present day gunboats are varied. A peaceful survey may be in progress one day, with the main triangulation stations established and the soundings in progress. During the night, the radio reports a revolution; and by the following morning the ship is on its way, leaving behind the survey signals flying in the breeze. Revolutions have been the national sport of a number of little countries for some time. They have been the substitute for such a game as baseball, and give the people the required amount of excitement. In such a country, they have either just had one, or are speculating about the next. At the

same time they are busy drawing up claims for the one before the last, which however, may be compromised by a small political job of some sort. When the gunboat arrives in the middle of such an affair, its good offices are not always appreciated. The wrong side is apt to be a bit disgruntled when the game is stopped, and they may express their feelings by peppering the ship during the night before taking to the hills.

These revolutions are unfortunately more than a game, they are a disease that is frequently contagious. The men who start them do so for what they can get out of them. They are counting on either being bought off, a method that has been used extensively in the past, or of receiving some political jobs for themselves and their friends. When the government in power does not feel strong enough to crush an uprising, it may silence the leader by giving him a position such as minister to Belgium at ten thousand a year.

Methods of this sort are apt to be embarrassing to the gunboat. On one occasion, a landing force may be close on the heels of a fire eating revolutionist, who has been declared an outlaw by the United States and everyone else. Shortly after, he may pass proudly by aboard some steamer on his way to the capital to fill the appointment of minister for war.

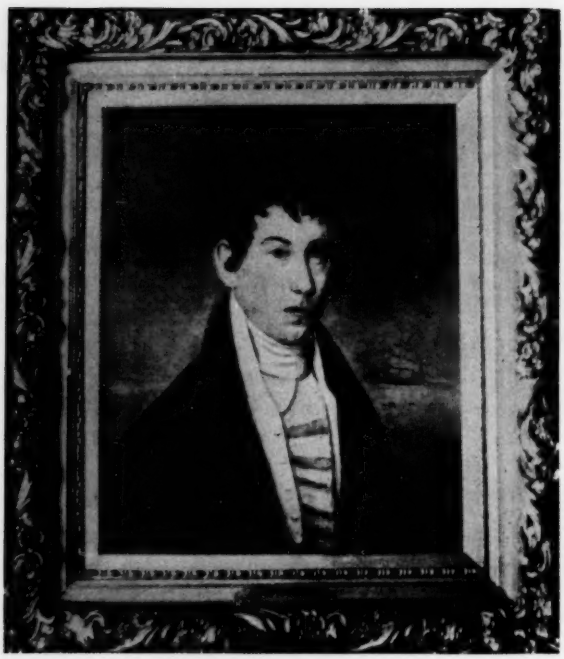
These constant revolutions must stop before any real progress can be made. Some countries are in need of a collector of customs and a comptroller to supervise expenditures. Until this is done, their financial condition will remain hopeless, and what money is obtained from the revenues, will be squandered among the politicians, or used in buying off trouble makers. Take the incentive out of their reach, and there will be peace. A large circle of professional politicians may die of a broken heart, but they will not be missed, and the schools, roads and lighthouses will have a chance.

A gunboat on its rounds may stop to take the gold from a bank that is about to be raided by the government, and carry it to a safe place. An ex-president may occasionally be found who has just escaped from somewhere and would like to go somewhere else. A custom collector has unearthed an elaborate system of coffee smuggling and needs moral support. The revolutionists surrender and come in to give up their arms, provided they get something for them. They keep the good ones and the gunboat collects the bad ones, and the war is finished. Or perhaps the horse-marines

at the other end of the island are short of hay or oats and other things, so the good ship loads up like a farm wagon and goes down the line.

Once in a while the water supply of some town is broken by the enemy, and the landing force goes ashore to repair the damage. Just at this moment the 23rd Division of the rebel army interferes, claiming the pipe line as its special property. The fight that follows is an excellent test of the small arm target practice, and ends with the water running in the pipe line, and the 23rd Division running over the hills. A formal protest may be expected, when the commander-in-chief, and high general staff, on the other side of the mountains, see what is left of this wing of their army.

The crew of a gunboat must be prepared to do any duty from towing a submarine in heavy weather, to putting a broken up rail road into commission, and steaming through on the first run as coxswain of the locomotive. In fact, most anything is apt to happen to a gunboat.



SENATOR OTWAY BURNS,

Who Commanded the United States War Schooner *Snap Dragon* During Her Three Most Remarkable Cruises in the War of 1812-15

From the original painting now in the Senate Chamber of the Capitol at Raleigh, N. C.

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THE EXPLOITS OF OTWAY BURNS, PRIVATEERSMAN AND STATESMAN

By EDGAR STANTON MACLAY

So closely allied were the naval and privateer services of the United States in the first decades of our national existence that they may be considered as one, as, indeed, they are to-day when commerce destroyers are a recognized part of the navy. At the time of the Revolution and the War of 1812, American privateers virtually were the preparatory school for the regular service, as clearly shown by the fact that nearly all our early naval officers received their elementary training in private-armed craft.[1] Privateering was authorized by an act of Congress about the same time and in much the same wording as was the navy; while Article I, Section 8, Clause 11, of the Constitution empowered Congress to issue "letters of marque and reprisal"—and that power remains in force to this day. John Paul Jones, on his most memorable cruise, had several privateers under his command, and toward the end of the Revolution our private-armed craft, on a number of occasions, were called on to perform errands of national importance.

In view of these facts, it seems fitting that the early American privateersmen should be regarded as a part, if not a parcel, of our

[1] Some of the first captains in the United States Navy who served an apprenticeship in privateers were John Barry, Thomas Truxtun, Alexander Murray, Stephen Decatur, Silas Talbot, David Porter, John Rodgers, Isaiah Robinson, Nicholas Biddle, Joshua Barney, Daniel McNeil, Daniel Waters, George Little, Moses Brown, Dudley Saltonstall, Richard Dale, Charles Alexander, Edward Preble, Hoysted Hacker, John Burroughs Hopkins, Samuel Tucker, James Sever, Stephen Cassin, etc.

Among navy officers below the rank of captain there was a proportionately larger number who served in privateers, while among the seamen and marines there was an indiscriminate interchange of berths between the two services. There were many instances where officers in the navy, while waiting for assignments in the regular service, entered privateers to fill out the interim.

navy, especially when we remember that they occupied the larger portion of the maritime stage both in the Revolution and in the War of 1812. It is for these reasons that the extraordinary and long-forgotten career of Otway Burns, who commanded the North Carolina privateer *Snap Dragon* in the second war against Great Britain, is of peculiar interest to navy men. Burns was the father of Captain Owen Burns, U. S. N.; also he came from the state that gave us the gallant but ill-fated Master Commandant Johnston Blakeley, besides five Secretaries of the Navy.

Few characters in American naval history have taken such a strong hold on popular fancy as John Paul Jones. His career combined a degree of romance, daring adventure, extraordinary seamanship and supreme audacity seldom equaled in the annals of the sea. Otway Burns conducted a campaign on the ocean in the War of 1812 which, in some respects, was on a smaller but in other details was on a larger scale than the brilliant exploits of the great naval hero of the Revolution. That Burns was a man of unusual character is shown by the fact that, on the close of the war, he served seven terms in the North Carolina House of Commons and five terms in the Senate. So distinguished were his services that the seat of Yancey County, N. C., was named Burnsville in his honor.

In the insignificant little schooner *Snap Dragon,* scarcely 70 feet over all, armed with only five small guns and manned by about 100 men, Burns, in three cruises, kept the sea 358 days, replenishing his water casks from mid-ocean icebergs, boldly putting into English ports for provisions, and sweeping the Atlantic from Greenland to equatorial South America. He captured 42 English vessels (which, with their cargoes, were valued at more than $4,000,000), made prisoners of war more than 300 English officers and sailors, and gave successful battle to several of the enemy's war craft—a record of astounding audacity and brilliant success that has few parallels.

Only at a comparatively recent date have the logbooks and accounts by active participants in these cruises been discovered. The record of the first cruise is preserved in a summary made from the *Snap Dragon's* original log, now in the archives of the University of North Carolina. An account of the second cruise was published in the *Raleigh Register* in September, 1813, which recently was brought to light by Kemp Plummer Battle, LL. D.,

CAPTAIN OWEN BURNS, U. S. N.
From the original painting

professor of history in that seat of learning. The story of this privateer's last venture has been pieced out from papers left by the Collector of the Port of Newbern, N. C.—Captain Burns' point of departure throughout the war. From these well-authenticated sources we obtain a fairly complete account of one of the most picturesque and dramatic privateering careers in the War of 1812.

Otway Burns was born on the paternal farm, two miles from Swansboro, N. C., in 1775, so he was 37 years old when the War of 1812 broke out. His grandfather, who came from Ayreshire—a section of Scotland made famous by the poet Burns—emigrated to North Carolina in 1734. It was from this part of southwest Scotland that John Paul Jones came, and, as the great sea fighter of the Revolution learned his first lessons in practical seamanship on the waters of the River Dee and the Firth of Solway, so Otway Burns developed his extraordinary ability as a navigator on the intricate sounds, inlets, rivers and creeks of North Carolina. From sailing craft to building vessels seemed a natural step for Otway Burns. After he attained his majority, he established a shipyard at Beaufort with which he was identified many years. For a time preceding 1812 he engaged in the coast trade, personally commanding vessels from Newbern to Portland, Me.

Early in June, 1812, Burns sailed from Pamlico Sound, bound for Portland. Before reaching his destination he spoke an American vessel and learned that war had been declared against Great Britain. Putting into Portland, Burns found several craft there which were being fitted out as privateers. A number of citizens offered to purchase his vessel, equip her as a privateer and send her out under his command. The offer was tempting, but Burns showed good judgment in declining. He argued that "speed and spirit" were the two essentials for the proposed venture. His craft was slow, and he wished to select his own crew from men with whom he was well acquainted and of whose "spirit" he was assured.

FIRST CRUISE

Risking the chance of capture, Burns put out to sea in his clumsy coaster and had the good fortune to reach New York in safety. Looking over the available craft in that port, he picked out the 147-ton schooner *Levere* and, selling his own vessel, he purchased the *Levere* for $8000, renaming her *Snap Dragon*. This craft was scarcely 70 feet over all, lying so low in the water by

the stern as to enable anyone to touch the sea with the hand when reaching out of a cabin window. She was narrow and had very low bulwarks. Four or five 6-pounders were mounted on her open gundeck and a long 9-pounder was pivoted amidships. About 50 muskets, a few blunderbusses, pistols, cutlasses and boarding-pikes completed her armament.

Burns caused yards to be fitted to her foremast (and possibly on the mainmast), which could be sent on deck at short notice when the schooner was beating against the wind, or could quickly be replaced when running before a gale. By this means the *Snap Dragon* combined the advantages of a fore-and-aft schooner and the square rig of a brig. This was the insignificant little craft that was destined to achieve one of the greatest privateering successes in this war. Indeed, through the prudence, skilful seamanship, daring and resourcefulness of her commander, her career rivaled that of the most notable of our regular warships.

Acting with as much caution in selecting his crew as he had done in securing a suitable craft, Burns sailed from New York with only the few men who composed the original crew of the North Carolina coaster. He put into Newbern, N. C., where he was intimately acquainted with the sailors. He let it be known that no wages were to be paid, either to officers or crew. He wanted only such daring spirits as were willing to take chances in prize money in lieu of wages. When Burns settled accounts after his second cruise, not a man in the *Snap Dragon* received less than $3000 as his share, while each of the officers could have retired with a "fortune" which, in those days, was considered ample. Indeed, with interest ranging from 8 to 12 per cent, and with prime beef at 3 cents a pound on the hoof, rum at 3 cents a tumblerful, and other "necessities" proportionately cheap, a man with $10,000 cash might well be considered "comfortably fixed" for life.

Not wishing to assume all the risk himself, Burns turned his venture into a stock company, and some of the prominent men of the Tarheel State became shareholders. Among them were James McKinley, William Shepard Bryan (father of John H. Bryan, lately a distinguished lawyer practicing in Raleigh), John H. Bryan (father of Judge William Shepard Bryan of the Supreme Court of Maryland, and of Judge Henry R. Bryan of the North Carolina Superior Court), James Harvey (one of the leading citizens of Newbern), Isaac M. Taylor, and Dr. Edwards Pasteur.

Evidently the leading men of North Carolina knew Burns well and had confidence in his integrity and ability.

DIFFICULTIES IN OLD-TIME ENLISTING

In the matter of inducing the right kind of men to enlist in the *Snap Dragon,* Burns experienced difficulties that were peculiar to his day. A shipping office was opened in Newbern and about 40 men enlisted. At that period of the war many prominent men of Newbern were opposed to hostilities against Great Britain and did all in their power to prevent Burns from filling out his complement. Men who had enlisted were inveigled into debt and were then arrested under civil process. In spite of Burns' order that no process-server should be allowed aboard, six constables in a boat, one day, attempted to board the *Snap Dragon* as she lay anchored in the river—notwithstanding repeated warnings to sheer off. Observing that the officers were insistent, Burns caused their boat to be capsized. The officers of the law clung to the bottom of the boat until they drifted ashore. The log records that "this frolick finally broke the constables."

This drastic interference with the law aroused indignation among some of the good citizens of Newbern, and a crowd collected on the wharf nearest the privateer. Acting as spokesman, a lawyer named Martin hailed Burns (who was pacing the *Snap Dragon's* deck) and hurled such epithets as "licensed robber," "legalized thief," etc., at him. Burns promptly manned his gig, gained the wharf, seized the offending lawyer and threw him into the river—nor did Burns permit his rescue until Martin had apologized.

Finding it impossible to complete his crew at Newbern, Burns sailed with such men as he had and put into Norfolk, Va., where he found the 12-gun privateer brig *Revenge,* Captain W. Langdon. This being the maiden attempt of both Burns and Langdon at privateering, these commanders agreed to sail in company. Completing their enlistments, they sailed from Hampton Roads about the middle of August and ventured on the broad Atlantic to try out the sailing qualities of their craft and the nerves of their officers and men—as well as their own.

It is doubtful if there was a man in either privateer who ever before had sailed under actual war conditions. Without doubt they experienced that tremulous excitement natural to the inexpe-

rienced. One of the *Snap Dragon's* petty officers, named Thompson, was conspicuous for his loud boastings of how he would "eat an Englishman alive." In fact, his mouthings became almost intolerable. Others of the crew, also, while in port, vaunted their bravery when they should have the "good fortune to meet a worthy foe."

PREMATURE BOASTINGS

Soon after the *Snap Dragon* and *Revenge* cleared the Capes, a sail was reported off the weather bow and the privateers made sail in chase. Within two hours the *Snap Dragon* had so far demonstrated her superior sailing as to be several miles in advance of her consort, and was rapidly closing on the stranger, which was now seen to be well armed. It was an excellent opportunity for the braggarts to make good their boastings. As the chase displayed a willingness to fight, Burns cleared for action, loaded his cannon and sent all hands to quarters. Then it was that some of the boasters turned pale; a few actually suggested to Burns that he had better wait for the *Revenge* to come up. Evidently Burns had not as yet broken his greenhorn crew into the strictest discipline of a war craft. Being "stockholders," some of the men thought they had a voice in the management of the vessel as well as a share in her profits. Some of the men whispered: "That fool [Burns] will send us all to prison or the devil by imprudently running alongside a strange vessel before he knows what she is." About this moment Thompson disappeared from the deck, declaring that he had important duties to perform in the hold—which was beyond the reach of shot.

Burns paid no attention to these panicky symptoms and continued steadily on his course. When in easy gunshot, the stranger fired a gun to leeward, broke out the Stars and Stripes, and signaled that she was a Baltimore privateer. Thompson now promptly reappered on deck and resumed his boastings in such an offensive manner that Burns rebuked him before the assembled crew, declaring him to be "loudest in peace and stillest in peril." At this Thompson affected wrath, exclaiming that "Captain Burns felt safe in using such language, being his superior officer, but he would not dare to do so if ashore and on equality."

A witness of this episode records that "Captain Burns told him that he waived all distinctions of grades, and called upon the other officers to witness that he held himself in this particular on an

equal footing with him, and, further, he told Thompson that under the circumstances he considered it important for the discipline of the vessel to administer to him, with his own hands, 'a genteel flogging,' and that he was at liberty to defend himself. Thompson submitted, and Burns chastised him with the end of a rope."

A few weeks afterward, when the *Snap Dragon* was off St. Mathews on the Spanish Main, Thompson was cashiered and put ashore. He vowed that if ever he met Burns on land he would kill that commander. Thompson did not return to the United States until after the war, and, as luck would have it, almost the first man he met was Captain Burns. So far from carrying out his threat, however, Thompson begged that the "unpleasant incident" aboard the privateer be forgotten.

Soon after falling in with the Baltimore privateer, the *Snap Dragon* and the *Revenge* descried two promising sails—and again the nerves of the embryo privateersmen were tuned to the highest pitch. The privateers made all sail in pursuit and, as before, the *Snap Dragon* rapidly distanced her consort, much to the distress of those timid souls who thought that Burns was steering them to certain destruction. By firing a shot across their bows, Burns caused the strangers to heave to, and, on sending a boat aboard, it was learned that they were Spanish. These chases, however, proved to be valuable practice to the raw recruits in the *Snap Dragon*. The men gained confidence in their craft, in their officers and in themselves. Forthwith they could hear the cry, "All hands clear ship for action!" without "turning pale."

GETTING IN REAL TOUCH WITH THE ENEMY

After Burns had cruised in company with the *Revenge* eight or ten days he had brought his crew under fairly good discipline, had mastered the "tricks" of the *Snap Dragon,* and was satisfied that she was one of the swiftest craft afloat. Emboldened by this, he parted company with his slower consort and continued his cruise alone. Confidence in the sterling qualities of his craft was increased on the following day when he fell in with a British frigate and sloop-of-war. As soon as Burns determined the character of the strangers, he demonstrated, to the delight of all aboard the privateer, that the *Snap Dragon* could show an exceedingly "pretty pair of heels," by quickly dropping the enemy below the horizon.

Late in the evening, a few days after, the *Snap Dragon's* lookout reported a sail and hot pursuit was made for it. By the time night had settled over the ocean and the privateer was alongside the chase, Burns fired a gun, which induced the stranger to surrender. She was a British merchantman (the *Snap Dragon's* first prize), carrying 14 guns, but having a crew of only about ten men.

Gradually making his way southeastward of the Bahamas, Burns sighted the island of St. Thomas (then in the possession of Great Britain, a few miles due east of Porto Rico), and, sending in a boat to reconnoiter the harbor, learned that several merchantmen had dropped down the roads preparatory to sailing. Determined to cut the vessels out on the following day, Burns hauled to windward of Buck Island and, under cover of night, disguised the *Snap Dragon* so as to resemble a merchantman.

Evidently the British at St. Thomas had been informed of the approach of the privateer, and when day broke Burns was surprised to find himself in a veritable nest of English war vessels—three dead to windward and two leeward. In the hope of gaining time, Burns hoisted Spanish colors, but the enemy was not deceived, for the largest craft, the frigate *Garland*, fired a 32-pound shot at the frail privateer, but, fortunately, missed the mark. As it was not a propitious moment for "arguing," Burns threw off his disguise and made every exertion to escape.

Forty miles windward was Sail Rock, and for this goal Burns headed his craft, maneuvering so as to keep his pursuers in doubt as to which side of the rock he would pass. On sped the little privateer, with the five men-of-war in full cry after her. Many shot from their chase guns whistled unpleasantly near the *Snap Dragon,* some striking the water so close as to throw spray on her deck.

Reaching a point where he must change his course or crash onto the rock, Burns took the helm, sent all but a few of his men into the hold, where they would be safe from hostile missiles, and sent the *Snap Dragon* spinning round on the opposite tack, where she was compelled to pass within a few hundred yards of two British brigs-of-war. These brigs delivered their broadsides, but, aside from cutting a few sails, inflicted no serious injury. In their haste to fire again, the gunners of one of the brigs, the *Sophia,* shot through their own bulwarks. Before a third broadside could be given the speedy privateer was out of range and, making short

tacks in the teeth of the wind, soon was out of danger. Burns then showed his colors, fired the traditional "gun of defiance," and disappeared in the oncoming night.

On the break of the day following, when the *Snap Dragon* scarcely had recovered her "breath" from the hard run of the preceding 24 hours, she fell in with the British frigate *Dominick*, which chased the privateer all the way down to Tortola Passage before giving up the pursuit. In this run the wind held so fresh as to carry away the *Snap Dragon's* jibboom and two topmast stays.

A BOLD DASH INTO TORTOLA

Notwithstanding the fact that Burns now had come to believe that these waters were "fairly swarming with British cruisers," he hovered in that vicinity, and while near the island of St. Croix (Santa Cruz), a few miles south of St. Thomas, made several prizes. By some means British officials in this quarter were kept fully informed of the *Snap Dragon's* whereabouts, and they dispatched the 10-gun brig *Nettler* from St. Thomas to catch this "persistent privateer."

Working his way northward, Burns again found himself in the Tortola Passage, when his lookout reported a sail, which soon was recognized as the *Nettler*. Burns had become thoroughly "tired of running," as he expressed it, and, knowing the short-handed condition of the British cruiser and the unprepared state of her batteries, he determined to fight her. The *Nettler* came down under full sail, but when about two miles from the privateer the English commander (probably realizing his own precarious condition) put about with the *Snap Dragon* after him. The chase was kept up from 6 o'clock that morning until half-past 6 that night, when the *Nettler* gained the harbor of Tortola and anchored beyond the forts.

The formation of this harbor was such that it was possible for a vessel to enter one way and pass out by another. Some of the *Snap Dragon's* officers were well acquainted with this port, and, availing himself of their knowledge of local conditions, Burns, instead of relinquishing his chase of the *Nettler* at the entrance of the harbor, hoisted British colors and continued boldly after the brig. Before the garrison could be warned, the *Snap Dragon* had safely passed the fort and anchored about half a mile off the town.

It being dark by this time, Burns manned his boats with a view to capturing some of the merchantmen in port. With muffled oars the men pulled to a point of land about a hundred yards distant on which (as they thought) a flock of sheep was sleeping. In reality it was a battery, the guns of which had been painted white. Passing this "woolly battery undetected," the Americans approached a supposed merchantmen and were about to make a dash for her when she hailed. The hail not being satisfactorily answered, the "merchantman" delivered a broadside, for the merchantman was none other than the *Nettler* with her crew at quarters and fully prepared for action.

The sound of this broadside aroused the town. Rockets now sped across the sky and soldiers hastened to the batteries and manned the guns. The American boat party decided on a retreat, but in the darkness they lost their bearings and knew not in what direction the *Snap Dragon* lay. Anticipating their difficulty, Burns hoisted a light aboard the privateer; but that revealed her position to the gunners in the batteries, and in a short time she was a fair target for cannon. Thereupon Burns extinguished his light and returned the shore fire with his long-tom, the flashes from which enabled the boat party, finally, to regain the privateer. Burns then ceased firing, manned his sweeps, and brought the *Snap Dragon* out of range. Hearing the report about "sheep" being on shore, Burns immediately sent a boat ashore and from a nearby plantation purchased some real sheep, poultry and vegetables. With his larder thus replenished, the privateersman put to sea, and by daylight was 20 miles from Tortola, waiting for any fortune or misfortune that might next present itself.

LIVELY EXPERIENCES IN THE WEST INDIES

He did not have long to wait, for it was only a few hours after his escape from Tortola that Burns captured an English vessel bound for St. Croix, having on board 40 to 50 Guinea negroes, besides other "merchandise." As the slaves expressed a desire to go to the United States in preference to the West Indies, about 18 of the "blackest" of them were taken aboard the privateer, while the prize was released and permitted to continue on her course. Some days later, while the *Snap Dragon* was off St. Croix, her boat was sent into the harbor and cut out a schooner, which was burned.

Burns then skirted the southern coast of Porto Rico and ran into Ponce, where he was hospitably entertained by the Spanish Governor, who permitted the Americans to replenish with water and whatever stores they desired—Burns selling some of the dry-goods he had taken out of prizes, thereby being able to pay cash. Also he purchased of the Governor "a very fine long 9-pounder"—a breach of neutrality which seems to have escaped governmental notice.

Five days later the *Snap Dragon* got to sea again and made sail in chase of an English packet, but, a tremendous gale coming on, the privateer was compelled to abandon the pursuit. All that day and most of the following night, Burns kept the deck in efforts to prevent his little craft from foundering. Her jibboom was carried away and the cutwater was started. About 4 o'clock on the following morning Burns, completely exhausted by 20 and more hours' strain he had been under, went below for a little rest, leaving the deck in charge of a lieutenant.

Soon afterward the wind shifted and forced the *Snap Dragon* into the trough of the sea. She was thrown on her beam ends at such a dangerous angle that the guns on the weather side broke from their lashings, dashed down the precipitous incline of the deck and smashed against the lee bulwarks with such force as to start the side planks for a distance of more than 13 feet. The water gushed through the openings and speedily filled the waist of the craft. Burns rushed on deck and, taking advantage of a fortunate lull in the wind, brought his schooner on the opposite tack, which raised the leak above sea level. The carpenter reporting three feet of water in the hold, all hands were set at the pumps and at bailing. It required two hours of hard work before the hold was cleared of water.

The storm had carried the *Snap Dragon* southward, half way across the Caribbean Sea, and finding that extensive repairs were imperative, Burns ran into the Gulf of Venezuela and, in a little fishing cove near Maracaibo, made the necessary repairs by permission of the Governor. That official "paid us a visit and was treated as well as the nature of our circumstances would permit. We were invited, in turn, to dine with him."

Learning from fishermen that several English vessels were farther up the Gulf, trading with the Spaniards, Burns made sail in search of them. At 11 o'clock on the morning he left the cove,

he came upon five of these traders and captured three of them. They were loaded with dressed skins and drygoods. Filling the largest of the prizes with these goods and placing her in charge of a prize crew with orders to make for the United States, Burns released his two remaining prizes.

"IN A TIGHT FIX"

Only a short time after this, Burns had another experience with the ubiquitous English cruiser. Early one morning four large ships were sighted, apparently sailing in company. As he held the weather guage, he ran down to investigate. Some of his officers were anxious to close at once, as they concluded that the strangers were merchantmen and would prove a "rich haul." Burns, however, was cautious.

As he drew nearer he noticed that three of the strangers kept well under the lee of the fourth ship, which was rigged in a suspiciously negligent manner, having her fore and mizzen topgallant masts struck while her topsails seemed to be badly patched. There being a fine breeze at the time, Burns ventured nearer than he ordinarily would have done. When well in gunshot, he fired several shot at the "merchantman," and, although hulling her each time, elicited no reply. Nearer still drew the rakish privateer, when Burns, after a careful scrutiny through his glass, discovered that the topsails of the stranger were not "patched," but had a number of black pieces of old cloth pinned on them so as to resemble patches. The "merchantman" was, in fact, the British cruiser *Fawn,* one of the swiftest craft in the royal navy, and was endeavoring to decoy the Americans under her guns.

On penetrating this deception, Burns put about and began a series of short tacks into the teeth of the wind, whereupon the *Fawn* reset her topmast with remarkable celerity and gave a broadside of grape and canister which cut holes in the *Snap Dragon's* sails, but did no further damage. Then began a long, hard chase. In a thrash to windward, the fore-and-aft rigged privateer had the advantage, of which her men availed themselves with feverish energy; but, as the wind increased in violence, Burns was compelled to "furl topgallant sails, single reef topsails and take a bonnet out of the fore sail. It was pretty tight times, the wind blowing big guns, the sea breaking over us, and a dangerous stranger walking right in our wake—who had, by this

time, forereached us four or five miles, but we were to windward." So records an eyewitness.

But another peril awaited the fleeing privateer. Land loomed up directly ahead, and it became only a question of a few minutes when she must change her course to port or starboard; in either alternative her pursuer would gain greatly upon her. Describing this dilemma, our chronicler records: "When we got pretty near land, Burns tacked ship and a squall came off which favored him, so he headed to windward of our bow; the wind still increasing, we were forced to furl topsail. Now came the rub: which was to weather the other, the *Snap Dragon* or the ship? Burns had sent all of his men below except just enough to work the vessel; some of the officers wished to keep the *Snap Dragon* away from the wind, but he paid no attention to anything they said. He knew his business too well for that, for the ship would have been alongside in a jiffy. Men and officers were all packing up their baggage to go aboard the stranger, for we made certain we were all ticketed for a free passage to England. As good luck would have it, just at the scratch as the two vessels were meeting, the wind favored the little *Snap Dragon,* and she weathered the ship, 300 yards off. Just as the ship got abreast of us, he up ports and gave us another broadside of grape and canister. Burns had the helm himself, the men all lying low, and as the ship fired, it appeared as if the *Snap Dragon* dived like a duck, so that nearly all the shot flew over us; only four or five struck our sails.

"'Now, boys,' says our commander, when he saw that none of our spars were gone, 'now we are safe.' We were so near the ship you could tell the officers from the men, and almost hear the commands they gave. Before he could get another shot at us, we flew by him. We were heading on one tack and he on a different one, so he attempted to tack and missed stays; at the same time the *Snap Dragon* split her flying jib and carried away two back stays; but we repaired them without loss. Burns was determined to make short tacks, dead to windward. He knew the *Snap Dragon* would not miss stays, and he found, in such a gale, the ship could catch him in long tacks. Again he ordered her in stays and she spun beautifully, hard as it was blowing, and she buried in the waves. The ship had now just got on the right tack, but we shot by him again, a little further than before. He paid us his compliments at parting, but it was impossible to hit our hull, for that

was almost under water. Towards night it moderated a little and we put on more sail. At sunset the *Snap Dragon* was more than two miles dead to windward; dark came on and that was the last we ever saw of our troublesome customer. Nothing saved us that day but the exertions of Captain Burns alone and his skill in sailing maneuvers."

A few days after this narrow escape, the *Snap Dragon* captured an English vessel from Curaçao, and from her people learned that the *Fawn* had put into that port after her chase of the American privateer and reported that she had sunk her. Without doubt, the *Fawn's* commander made his statement in good faith, for, in those heavy seas, the low hull of the *Snap Dragon* scarcely was visible; and, after firing three broadsides at short range, the enemy was justified in believing that they had left her in a sinking condition.

"I'LL HANG EVERY MAN OF THEM"

Skirting along the Venezuelan coast in a westerly direction, the *Snap Dragon* appeared off the port of Santa Marta. Some of the Englishmen taken in the last prize now asked to be set ashore. Always extending every kindness to prisoners, Burns consented, but gave warning that they might be thrown into prison by the Spanish authorities. The prisoners were willing to take the risk, and were sent ashore in a boat with one of the privateer's officers, the *Snap Dragon* meantime keeping just beyond gunshot of the fort.

Hour after hour Burns vainly awaited the return of his boat. Late in the afternoon he sent another boat with another officer, who took with him the privateer's commission. That boat was seized (as had been the first) by the local officials and her men were thrown into prison, where they found the crew of the first boat and the English prisoners. After much arguing, the Spaniards permitted the last boat, with only the officer in it, to return to the *Snap Dragon* with the message that the privateer must anchor under the guns of the fort before her men would be released.

Knowing the duplicity of Spanish officials in those out-of-the-way ports, Burns refused. It was now 8 o'clock at night, and a bright moon enabled those on shore to plainly make out every movement of the schooner. Hoisting sail, Burns stood out to sea, as if abandoning his men to their fate, and by daylight on the

following morning the *Snap Dragon* could not be seen from the shore. Burns now stationed himself so as to intercept any vessel leaving Santa Marta.

Shortly after sunrise a large felucca was descried coming out of the port. Burns gave chase and captured it. The felucca had on board 100 men and some unmounted cannon intended for the fortifying of a nearby point known as Porto Cabello. Sending the felucca's commander ashore with the message that every Spaniard in the prize would be hanged unless the *Snap Dragon's* men were returned within two hours, Burns approached in full view of the town and rigged two gallows on his craft so they could be seen plainly from the shore. Before the two hours had lapsed the *Snap Dragon's* men had been restored and the felucca and her men were released. "There never was a set of men," records a witness, "worse frightened than these Spaniards, and if that plan had not been adopted, we never would have seen our men again." Possibly the fact that the Governor's brother-in-law was among the *Snap Dragon's* prisoners had something to do with this record-breaking celerity in Spanish official action.

FIGHTING A SPANISH MAN-OF-WAR

Running short of water, Burns shaped his course southwesterly for Cartagena, and on the following morning fell in with three sails, which proved to be a 12-gun brig and an 8-gun schooner, Spanish coast-guard vessels, escorting an English merchantman. As soon as the *Snap Dragon* drew near, the brig fired a shot across the privateer's bow. Burns sent his men to quarters and, running alongside the brig, demanded an explanation. The Don said that the merchantman was under his protection. Burns replied that the United States was at war with Great Britain, and as this English craft was far beyond the neutrality limit, he proposed to capture her. Accordingly, Burns seized the merchantman and, placing a prize master with 20 men aboard, ordered her to keep near the *Snap Dragon*.

Next morning Burns transferred a large quantity of goods from his prize, and ordering her to remain outside the neutrality zone, he ran into Cartagena, where he got permission to refill his water casks. Meantime the commander of the coast-guard brig had landed at a little port westward and sent word (overland) to Cartagena that the *Snap Dragon* had fired into him and had taken

the English merchantman within neutrality limits. Unknown to Burns, the Spanish at Cartagena sent out three gunboats in search of the privateer's prize. They found her where Burns had left her. The gunboats opened fire, which the plucky prize-master returned with such guns as he found in the merchantman.

Burns, in Cartagena, soon discovered what was going on, and he sent a boatload of reinforcements to the prize-master. But the Spaniards dispatched two more gunboats, which captured the American reinforcements and then, uniting with the three other gunboats, finally captured the prize and brought her into Cartagena. The prize crew was thrown into jail, where two of the men died through ill-treatment. The Spaniards took all the valuables (including $15,000 in doubloons) out of the prize and robbed the Americans of every valuable article they had.

As the *Snap Dragon* was anchored under the guns of the fort and was surrounded by Spanish men-of-war, Burns was helpless, there being no United States consul or agent at that port. It was a case where discretion was the better part of valor, and by means of liberal bribes the officials, in the course of three weeks, were induced to release the surviving prisoners and the prize—after the latter had been stripped of the most valuable part of her cargo. In the course of these negotiations one of the *Snap Dragon's* crew attempted to desert, but being caught before he got away, was placed in irons. By some means this fellow managed to communicate with the local authorities, declaring that he was a Spaniard. The commander of the Spanish gun-brig boarded the *Snap Dragon* and ordered the release of the would-be deserter. "Some very high words passed between him and Burns," says our recorder; "Burns happened to be on deck at the time. The Spanish commander drew his sword and Burns caught up a boarding-pike and was in the act of staving it through him, when one of our officers prevented him; and the Spaniard left in a hurry. The whole affair did not cost the stockholders of the *Snap Dragon* less than $20,000, besides her detention."

When the *Snap Dragon* finally was permitted to sail, the masters of some 15 or 20 English merchantmen in Cartagena at the time induced the Governor to keep the privateer in port a week after they had sailed, which, although in accordance with international law, was not in accord with the "bribe law" that dominated all else in Spanish colonial officialdom at that time. Altogether, the

Snap Dragon's experiences at Cartagena were not as satisfactory as could have been desired.

How bitterly the American sailors who had been imprisoned in Cartagena resented the treatment they had been subjected to was shown in an incident that took place shortly after the *Snap Dragon* sailed from that port. One night, while on her passage to Jamaica, the privateer brought-to a Spanish brig, and a boat's crew with an officer was sent aboard her. Some of the boarding crew happened to have been among those who had been imprisoned in Cartagena and, while the boarding officer was below examining the brig's papers, they placed a rope around the neck of a Spanish seaman and were about to hang him at the yard-arm when the boarding officer interfered. This officer hailed the *Snap Dragon* declaring that his men would hang every Spaniard in the brig if not forcibly prevented. The boarders, finally, were induced to return to the privateer without carrying their threat into execution. Thereafter no member of the *Snap Dragon's* crew who had been jailed by the Spaniards was permitted to board a Spanish craft.

HOW BURNS QUELLED A MUTINY

Being short of provisions, Burns touched at the little island of Old Providence, about 150 miles east of the Mosquito Coast. Although belonging to Great Britain, it was not garrisoned, and Burns, relying on the force under his command and the seductions of ready cash, ventured into its harbor, where he purchased enough provisions to carry him to a home port.

While in this place, Burns gave his men shore leave, one-third of the crew going at a time. The first two liberty parties returned on time, but the last squad "found an old lady who lived up on a hill, and she had spirits to sell"—and that squad did *not* return in time. The *Snap Dragon* was ready to sail. Her fore topsail was loosed and the return gun was fired, but no signs of the truants. The first lieutenant was sent ashore and found the men at the old lady's house. They declared that they "had not gotten their frolic out, and if the lieutenant interfered with them, they would heave him down the hill." Learning of this, Burns got into his boat, was set ashore and, sword in hand, walked alone into the "pot house." The privateer's sergeant of marines, named Plane, acted as spokesman for the mutineers, and said to Burns:

"Captain, now that I am ashore, I am as good a man as you are."

Without a word, Burns struck the man down, and then cut and thrust at three or four others, who came to the sergeant's assistance, until little pools of blood formed on the sanded floor. Completely overawed by the ferocity and determination of their commander, the mutineers returned to their duty.

After a leisurely cruise around Cape Antonio, the western extremity of Cuba, the *Snap Dragon,* in 15 or 20 days, appeared off Havana, where she captured an English vessel from Honduras. After the most valuable portion of her cargo had been transferred to the privateer, the prize was released. Off Cape Florida Burns had a fight with the British privateer *Providence.* After the latter had been seriously crippled and had had several of her men killed or wounded, she retreated among the shoals of Biscayne Bay, where the heavier-draft *Snap Dragon* could not follow.

It was the run from Cape Florida to his home port that caused Captain Burns his greatest anxiety. The *Snap Dragon* had been cruising for six months, had taken 12 prizes, and her hold was crowded with the most valuable portions of her prize cargoes. She was, in fact, a "treasure ship." If Burns had found West Indian waters "fairly swarming" with British cruisers, he had every reason to believe that even a larger number of hostile war craft would be on the coast of the United States. It was to run this gauntlet of vigilant English cruisers that Burns now nerved himself for the "dash home" with his richly laden craft.

Stealing up the coast with lookout doubled, the *Snap Dragon,* on the day succeeding her encounter with the *Providence,* descried a large sail. "Was it a British cruiser or was it to be another prize?" That was the question uppermost in the mind of every man aboard the privateer. Owing to a light breeze, the Americans could not get within gunshot until nightfall, and, deeming it imprudent to close in the dark, Burns cautiously dogged the stranger until daybreak, when, from her rig, he concluded that she was an English ship from Havana.

Determined to risk the chance, Burns came within gunshot and signaled the stranger to heave to; but no attention was paid to the summons. The *Snap Dragon* now ranged alongside within musket-shot, fired a shot across the ship's bow—but still the silent craft ignored the order. At this moment Burns discovered that

the stranger mounted 20 cannon and had her crew at quarters—"and there were some long faces on board the *Snap Dragon,*" grimly records an eyewitness.

In answer to Burns' imperative hail, "What ship is that?" came the answer, "The *Fernando,* from Havana to Cadiz." As the reply was made in excellent English, Burns determined to "make sure." Again he ordered the stranger to heave to, and again the order was ignored until the privateer showed unmistakable signs of discharging a broadside. Then Burns sent a boat on board. The boarding officer "gave him a complete overhauling," and, finding the papers correct, the *Fernando* was allowed to proceed—much to the relief of some of the privateersmen who could not see the propriety of attacking a 20-gun ship, even if she were short-handed.

As the *Snap Dragon* neared Beaufort, N. C.; she sighted a small coasting vessel. Burns, having been without direct news from the United States more than six months, was anxious to obtain the latest information available, and so he made effort to overtake the coaster. Evidently the people in the coaster mistook the *Snap Dragon* for an enemy, and resorted to a deception which caused much amusement among the privateersmen. Believing the "enemy" was not familiar with these waters, the coaster's people pretended to be poling their craft; that is, pushing her along with poles. This was to give the impression that the water in that locality was very shallow, which would make it dangerous for the heavier draft "enemy" to pursue. Burns, however, well knew that at this place there was 42 feet of water, and he continued "mercilessly" in pursuit of the coaster and finally overhauled her.

It now was late in February or early in March, 1813, and soon the *Snap Dragon* was anchored safely near Swansboro, having completed a cruise of more than six months, in which she had made 12 prizes and had brought into port cargoes valued at $1,000,000.

SECOND CRUISE

It was in his second cruise, June 3 to August 16, 1813, that Captain Burns achieved his greatest success, taking 29 prizes, valued at $2,500,000. Not a deckhand or cabin boy in the *Snap Dragon* received less than $3000 for his services of only two and a half months.

Burns now had acquired full confidence in himself, his crew and craft. That the men idolized their gruff but generous commander is shown in an incident that occurred when the privateer was about to sail on her second venture. On returning from her West Indian cruise, the *Snap Dragon* had been placed in the carpenters' hands for much-needed repairs, and for such alteration looking to the improvement in her sailing qualities and fighting capacity as experience had suggested to her keenly observant commander.

DISCIPLINING AN OFFICER

Feeling that he needed an officer of experience as first lieutenant, Burns applied to his agents in New York. Just as the *Snap Dragon* was ready to sail the new lieutenant, James Brown by name, arrived. He was "a fine-looking fellow," and brought letters of highest recommendation; but he turned out to be a bully and a coward. Burns, who was on shore when Brown arrived, sent him aboard the privateer to take charge. Late in the afternoon of June 2, Burns went aboard and found that Brown had got the crew in great confusion. Eight or ten of the old seamen (among them being the best hands in the craft) were in irons. "One fine old fellow, by the name of Dick, who was a great favorite, looked at Burns as he came over the side, and began to cry."

Without saying a word, Burns entered his cabin, sent his steward (Jack Parker) on deck for Brown, and asked that officer what had occasioned the trouble. Brown said that the crew "were noisy and saucy, and that he would tame the damned rascals and show them how to behave." On questioning Second Lieutenant De Coakley, Burns learned that "Dick was cutting some of his monkey capers and the others were laughing at him; that they had just come off from the shore and were a little merry." Apparently Brown did not realize that the crew of the privateer served without wages and were, in a sense, stockholders in the craft.

Our chronicler records that "Burns very coolly told Mr. Brown that that would not do on board a privateer, though perhaps it might do aboard a king's ship." This reference to a "king's ship" would indicate that Brown had served in the British Navy. Burns ordered him to release the prisoners. Brown replied that he felt it beneath his dignity to do this personally, and remarked that he would have the master-at-arms do it. "No, sir," replied Burns.

"You put them in irons, and you shall take them out." Brown still hesitated, whereupon Burns caught his sword and said: "Now, sir, obey my orders or I will run you through." Brown obeyed.

CHALLENGE TO A NAVAL DUEL

That night a boat arrived from Portsmouth, N. C., with a message from Lieutenant George Hutchinson of the English war schooner *Highflyer* (tender to the British ship-of-the-line *San Domingo*) to Captain Burns, challenging him to a duel between the *Snap Dragon* and the *Highflyer* off Cape Lookout. Hutchinson declared that the king's schooner was then making her way to the rendezvous and, if she did not find the privateer there, the *Highflyer* would "look into Beaufort" for the mischievous *Snap Dragon*. Burns promptly accepted the challenge. In an incredibly short time the news of the impending naval duel spread over Beaufort, "and a great many persons went down to the Cape to see the fight."

At 8 o'clock the following morning, June 3, 1813, the *Snap Dragon* (with her former armament of five carriage guns, a long 12-pounder on a pivot amidships, four blunderbusses, 50 muskets, and a crew of 127 men) stood down the harbor to meet the foe, accompanied by a fleet of smaller craft filled with people eager to witness a naval engagement—very much as the United States frigate *Chesapeake*, only two days before, had been escorted down Boston Harbor when she went out to meet the *Shannon*. Plunging her low bow into the ocean swells, the privateer cleared Beaufort Harbor, and headed for Cape Lookout.

Presently a sail was reported directly ahead. In due time it developed into the proportions of a schooner, and it soon became apparent that she was armed, with her crew at battle stations, awaiting the approach of the *Snap Dragon*. Burns at once cleared for action and rapidly came down on the stranger. The people who had come from Beaufort by the inland water route could now be seen scrambling over the narrow strip of land that separated the sound from the ocean. Quickly they sought vantage points from which they could view the fight.

When within gunshot Burns discovered that the stranger was the privateer schooner *Raleigh*, from Baltimore. The *Highflyer* (originally an American boat and on being captured by the British was converted into a tender) bore a strong resemblance to the

Revenge—hence the mistake of the *Snap Dragon's* people until they got to close quarters. The *Raleigh* continued on to Beaufort, while Burns proceeded up the coast in the hope of meeting the *Highflyer,* but nothing was seen of that craft. Burns hovered in this vicinity a whole day, and even sent a boat into Pamlico Sound in search of his challenger, but she had disappeared. On the 3rd of the following September the *Highflyer* was captured off Nantucket Shoals by the American frigate *President,* Captain John Rodgers.

CATCHING A "RASCALLY AMERICAN"

To avoid the tropical heat of a West Indian summer, Burns shaped his course northward for the more agreeable climate of Newfoundland. Those were days when means of heating seagoing vessels were exceedingly crude and, in most cases, entirely lacking; so that the selection of cruising grounds was determined largely by the season of the year.

On his second cruise Burns brought along several suits of British naval uniform, both for officers and sailors, believing that they might serve in an emergency. A few days after leaving the coast of North Carolina, the *Snap Dragon* found herself off the Grand Banks, where, on June 8, she chased and brought to a large merchant ship. As the stranger showed American colors, Burns hoisted the English flag and, dressing one of his officers in the uniform of a British naval lieutenant and his boat's crew as English man-o'-warsmen, sent them aboard the merchantman.

At that period of the war some American merchants engaged in the questionable practice of shipping provisions to Spain, where the British army was operating against the French. As these provisions were greatly desired by the British, their Admiralty issued "licenses" whereby American ships and cargoes bound for Spain were protected from capture by English cruisers, notwithstanding the fact that Great Britain and the United States were then at war.

One of the *Snap Dragon's* boarding party, Sailing Master James Smith, immediately recognized the commander of this prize as a North Carolinan. In fact, it was the American ship *Active,* laden with rice and flour from Wilmington, N. C., for Cadiz. Burns found the original American papers of the *Active* and informed her commander that he must send her into Halifax as a prize. Deceived by the British uniform, the skipper produced his

"license," which was designed to protect him from capture by English cruisers.

At that moment Smith walked aft and shook hands with the traitorous American, calling him by name; and then the *Snap Dragon's* colors were changed from English to American. An eyewitness of this incident records: "You never did see any poor devil as frightened as he was. After plaguing him a little while, we let him go, as we had no instructions in regards to licensed vessels. We tore up his British license, though. I have heard Burns often say, since, that he was sorry that he did not burn the ship."

GATHERING A RICH HARVEST

At 4 o'clock on the afternoon of June 24, having gained a position off Cape Race, the southeastern extremity of Newfoundland, the *Snap Dragon* overhauled three English merchantmen, all well armed, but, as usual, short-handed. After a smart action the bark *Henrietta,* Captain Mason of Liverpool, and the brig *Jane,* Captain Arkbridge of Martport, surrendered. The third vessel, the fine 10-gun brig *Pandora,* Captain Murphey of Havre de Grace, attempted to escape while the privateer was engaged with her consorts; but after a hard chase, Burns took her also. Two of these vessels were in ballast and, the paroled prisoners being placed in them, they were released. The *Jane* "was as fine a brig as I ever saw," says a chronicler, "and her cargo was invoiced at 80,000 pounds sterling. Put one of our best prize-masters and a crew on board and ordered her home. About a fortnight afterwards he bore down ten miles to windward to speak an American frigate, as he thought. By this bad management he and our prize were retaken and he was sent to Dartmoor prison, where he died."

At noon, June 27, Burns sighted a sail to the south and stood for it. At 2 p. m., when two miles distant, the stranger fired a gun and showed English colors, to which Burns responded with the Stars and Stripes, and made sail in chase, although he freely expressed the opinion that the stranger was a decoy, leading the *Snap Dragon* into a trap. All the following night Burns managed to keep on the track of the chase, and on the following morning overhauled it. It proved to be "a well-manned brig of 12 guns," and "we engaged her in a sharp conflict." Just as the combatants were getting warmed up to their work, the fog, which had enveloped the two craft, lifted and revealed to the astonished gaze

of the Americans a fleet of 25 to 30 vessels convoyed by a ship-of-the-line and several frigates off to windward. It was the outward bound fleet from St. John's, Newfoundland, to England.

In a moment one of the frigates was observed bearing down on the combatants under a press of sail. It was time for the *Snap Dragon* to depart. Burns clapped on sail and held a course parallel to that of the fleet. He soon found that he outsailed the frigate, "two feet to her one," and, availing himself of this advantage, he nimbly worked his way among the merchantmen and seized seven or eight of them. As it was impossible for the slow-sailing traders to elude the pursuing warships, they were released, "as Burns disapproved of destroying private property. He could have burned half of them in sight of the frigate, for we could go in and out amongst the thickest of them in spite of him."

Hovering off the harbor of St. John's, the *Snap Dragon* captured a vessel with a very valuable cargo of drygoods, which was manned and ordered home—but was recaptured a few days later. On the following day the privateer captured a 10-gun brig from England, which had a cargo invoiced at 70,000 pounds sterling. The commander of this brig, Captain Fox, was brought aboard the *Snap Dragon* and seemed to be completely crushed by the loss of his craft. An eyewitness describes him as being "a noble fellow. He had never been in America and expected, from what he had heard, that he would be robbed of everything he had. But all that he and his crew claimed as their personal property was restored to them. He came to love Burns like a brother." A few days later Fox gave practical evidence of his gratitude—as we shall soon see.

TEASING AN ENGLISH CRUISER

But Burns was compelled to display remarkable seamanship before he secured this prize. Before he manned his prize the swift-sailing 16-gun brig-sloop *Rifleman* of the royal navy hove in sight. Just as this new enemy came within gunshot, Burns had got a few of his men aboard his prize, and ordering them to make all sail before the wind, stood about to engage the *Rifleman,* in the hope of leading her from his prize.

The maneuver was successful, for the pugnacious Britisher gave chase to the privateer. Although the *Snap Dragon* had a breeze most favorable for her, the *Rifleman* proved remarkably swift,

"and for some time it was impossible to say which was the better. Burns said not a word for some time, for he never suffered any one to talk to him about sailing the *Snap Dragon*."

After the chase had lasted about an hour, the *Rifleman's* commander, after firing several shots in vain, realized that he was losing ground on both the privateer and her prize; so he abandoned the pursuit and headed for the prize, then hull-down on the horizon. It was now the *Snap Dragon's* turn to become pursuer. The *Rifleman* was armed with 18-pounder short-range guns which, if the privateer could be brought to close quarters, would have blown the Americans out of water. The *Snap Dragon* had one long-range 12-pounder on a pivot amidship. Burns was quick to see his opportunity. Knowing that he had a slight superiority in sailing, he soon brought his craft to a position just beyond reach of the *Rifleman's* short-range guns, but still within effective striking distance of his long-tom. Placing his best gunners in charge of this gun, Burns was able to pound the *Rifleman* unmercifully, while the Englishman could not reach the privateer with a single shot.

Finding that this punishment was wrecking his sails, rigging and masts, the *Rifleman's* commander again turned in pursuit of the mischievous privateer; and again Burns shaped his course so as to draw his pursuer from the prize—keeping exasperatingly just beyond reach of the Englishman's short guns. At moments Burns encouraged the enemy by allowing them to approach near enough to have their shot effective so a few of the privateer's sails were cut, when again the *Snap Dragon* would forge ahead, beyond the danger line.

Finally it dawned upon the British commander that the privateer was only "teasing" him away from the prize, and again he gave over the pursuit and made after the brig. Quite as promptly the *Snap Dragon* imitated the maneuver and employed her former tactics of keeping just beyond range of the *Rifleman's* short guns while the privateer plied her long-tom unmercifully. By this time, however, the prize had gained such a lead that she had little difficulty in making her escape in the oncoming night. Burns now made sail in earnest and soon ran the *Rifleman* out of sight.

INEFFICIENT PRIZE-MASTERS

Although the *Snap Dragon* made more prizes than any other American craft in this war, it was her misfortune to lose some of the most valuable cargoes through the inefficiency of her prize-masters. One record has it: "It was Burns' misfortune always to have a miserable set of masters, and it was strange that the agent and stockholders would go to so great expense in fitting out a vessel and then ship such trifling fellows; for, after all, it depends on the prize-masters to make a successful cruise."

This was the fate of the rich prize which had escaped from the *Rifleman* through the adroit maneuvering of Burns. Twenty days later, when the prize had gained a point between Bermuda and Cape Henry, it was retaken, through the "bad management and the drunkenness of the prize-master," by a British cruiser. Owing to the swift approach of the *Rifleman* when Burns was manning his prize, he was not able to take all the liquor out of her. As soon as the prize crew realized that they had escaped their pursuer, they made a search of the brig, discovered the spirits, and seemed to have reduced themselves to a state of drunken imbecility. Burns' strict orders were to run south and east of Bermuda, for from there to Cape Henry was a line of cruisers during the whole war. It was impossible to get in except at Beaufort and Ocracoke; and every master who disobeyed him was taken and carried to Dartmoor, and remained there until peace. Two of the prize-masters died there, besides 10 or 12 of the crew—all through drunkenness and mismanagement."

IN A TERRIFIC STORM

After eluding the *Rifleman* the *Snap Dragon* headed for Grand Banks, where she encountered a terrific storm in which Burns demonstrated exceptional seamanship. The wind came on with such violence that it became necessary to lower all the yards and topmasts, besides placing all the cannon in the hold as additional ballast. Burns kept the deck that night until 4 o'clock in the morning, when he went below for much-needed rest. At that moment the privateer was lying to under storm sails, the seas frequently making breaches across her deck.

Scarcely had Burns gone below when First Lieutenant Brown called down to him: "We're foundering!" An unusually heavy wave had swept over the little craft and put her bulwarks awash.

Burns regained the deck and found that the *Snap Dragon's* hull, literally, was "buried in the waves." He seized the helm "and kept her before the wind as the only chance for safety. We had never scudded before, and all hands gave themselves up to be lost. In ten minutes her waist was clear of water, and I never did see anything skip over the waves as she did in all my life," records an eyewitness. "Still, we knew that the first large sea that struck her, she might go down. In eight hours we were safe, the gale moderated, and we got up our guns and sent up our yards and topmasts. I have often heard Burns say that if a vessel could scud nine knots, no sea could board her; we ran ten knots the whole time we scudded, but I am well convinced that but for his superior management, the sun would never have shone upon us again."

BATTLE WITH A MAN-OF-WAR

From the Grand Banks Burns shaped his course to the harbor of St. John's, where he captured several coasters, but as they were laden with lumber, which was of little value in America, he followed his usual humane course by releasing them.

Early on the following morning a suspicious sail was sighted to leeward, and Burns bore down with his usual caution. When the *Snap Dragon* was about a mile from the stranger, Captain Fox (who commanded the brig taken several days before and was now a prisoner aboard the *Snap Dragon*) approached Burns and declared his belief that the stranger was the English 14-gun war schooner *Adonis,* that she was well manned, and was disguised as a merchantman so as to decoy the privateer under her guns. Fox had not forgotten the kind treatment he had received from his captors, and took this first opportunity of giving them valuable information.

There seems to have been no question as to the slovenly appearance of the newly descried schooner, whether or not she really was the *Adonis.* Her main topmast was down, her jibboom was drawn in, her sails and rigging were in a slatternly condition, while several bundles of barrel hoops were lashed to her quarters in such a manner as to conceal gunports, had there been any there. Not a gun or indication of any war equipment was observable about the craft.

So complete was the disguise that Burns himself, shrewd and penetrating as he was, believed her to be an ordinary coaster and

handed the spyglass to Fox. The latter took "a long squint" at the vessel and then declared that he was more convinced than ever that the stranger was the *Adonis*. He said that he had left her at St. John's not ten days before, and that, although he was a prisoner aboard the *Snap Dragon*, he would be very sorry to see Burns captured.

Apparently the disguising of the *Adonis* (for such the stranger was) had been a masterpiece in that art. She bore a complete resemblance to a "slatternly maid of the sea." Impressed with the earnestness of the British master, Burns decided to heed the friendly warning. But, even then, Burns was so deliberate in executing the maneuver necessary to draw away from the stranger that the vessels were only 200 yards apart when the American finally stood about. Then it was that the "coaster" threw up her concealed port covers and delivered a broadside of grape and canister. Continuing on her course to escape, the *Snap Dragon* returned the fire with such guns as bore, "and a sharp conflict ensued."

In the height of the battle, when several of the privateersmen had been struck down by the enemy's shot, Lieutenant Brown left his station and, with fear plainly depicted on his face, ran up to Burns, shouting: "We will all be captured in five minutes," and "In order to save the lives of the crew we should surrender at once." Burns instantly broke his speaking trumpet over the lieutenant's head and ordered him back to his post. "I wonder he did not shoot him," records an eyewitness.

From Fox, Burns learned that while the *Adonis* mounted 18-pounders, they were all short-range guns, and the shrewd privateersman instantly decided to repeat the tactics he had employed so successfully on the *Rifleman*. When the *Adonis* had reset her main topmast and jibboom, and had got her rigging in order again, the *Snap Dragon* was beyond reach of the enemy's carronades, while the privateer's long-tom was at a distance just suited for effective work. Burns quickly noted that the *Adonis* was much slower than the *Rifleman*, so instead of continuing his flight, he circled around his pursuer (just beyond reach of the Englishman's short-range guns) and began pounding him with his long 12-pounder—"very much like a cooper hammering around a cask," records an eyewitness. "After teasing her thus some time, we hauled off to repair damages, which were very slight, some

rigging cut and four men wounded. Burns then sent for Mr. Brown and broke him for cowardice, told him he was no longer lieutenant, but moved him forward. Mr. Coakley [the second lieutenant] was put in his place, and thus ended Mr. Brown's career as a lieutenant."

ENTERING THE LION'S DEN

After running the *Adonis* out of sight, the *Snap Dragon* captured an English 8-gun brig laden with salt from Liverpool for St. John's. This vessel had been brought to by the *Adonis* only a few hours before, and reported that the *Adonis* had had three men killed and five wounded in the action with the *Snap Dragon*. Being short-handed through manning so many prizes, Burns allowed this last capture to proceed unmolested.

The *Snap Dragon* now had been at sea more than a month and was running short of provisions. Not wishing to leave this highly profitable cruising ground so soon, Burns, with characteristic boldness and resourcefulness, determined to replenish his supplies by strategy. Working his way up the Newfoundland coast as far as Cape St. Francis, he came upon a fleet of about 90 English fishing craft, the vessels being from 40 to 100 tons each. Disguising his officers and men so far as possible with British naval uniforms, and hoisting English colors, he leisurely made his way in the fleet, boarded several of the craft, and exchanged rum for fish. "One old fellow came on board [the *Snap Dragon*] and examined our vessel very closely," records a chronicler. "Burns treated him very politely and invited him down into his cabin. 'Well,' said the old fellow, finally, 'Captain, this don't look like one of our English vessels, but we don't care so long as she doesn't trouble us.' He gave us some bait, so we went to fishing amongst them. We stayed there nearly all day, and took between five and six hundred fish."

Dropping anchor off a near-by fishing village, Burns sent his captain of marines with 25 men ashore, who "treated" the townfolk handsomely, purchased such supplies as were needed, and returned on board without their identity having been revealed.

While in this village the Americans learned that a British cruiser was expected in that port any hour. As the *Snap Dragon* was weighing anchor her lookout reported a strange sail heading for the port. Fearing that it might be the expected cruiser, Burns crowded on all sail so as to gain an offing before the stranger

closed the entrance of the harbor. The two vessels approached each other head-on, so it was mutually impossible to determine their characters or force. Anxious to secure the weathergage, Burns, as soon as he had cleared the harbor, tacked and soon discovered that the stranger was a three-masted schooner, "as fine a craft as ever sat on sea." He immediately stood after her, but it was too late—"she beat us by the wind. Burns was very mad, for we could have been alongside if we had kept on our course; but we did not like to run up until we found out what kind of a craft she was."

Afterwards it was learned that she was an American vessel from Bordeaux, laden with silks, wines and brandies, bound for Baltimore—an American craft protected by a British "license." It is a significant commentary on the skill of American shipwrights of that period that, while the *Snap Dragon* had been able to overtake every English vessel she had chased in this cruise, she was unable to catch this American-built schooner.

Cruising as far north as Hopedale, on the coast of Labrador, Burns headed oceanward, and in a few days, when only a short sail from Cape Farewell, Greenland, came upon some large icebergs, firmly and solidly aground in 180 feet of water. Much of the *Snap Dragon's* fresh water having become foul, Burns thought he could replenish his supply from these mountains of ice. Steering the little privateer cautiously leeward of these ice islands, where the sea was as smooth as a mill pond, Burns detected a stream flowing from the top of a berg in a little cascade which, glistening and sparkling in the bright sunlight, presented a beautiful spectacle. A boat was lowered and a party of seamen landed on the gigantic mass of ice. Footholds were cut in the ice, the men clambered up the slippery surface to the top, where they found a miniature lake formed by melted ice. Returning to their boat, they rigged a canvas trough and, by placing it under the cascade, were able to fill 20 casks with pure water.

QUICK WORK IN A GREAT FLEET

It was only a day or so after refilling her water casks in mid-Atlantic that the *Snap Dragon* made the "richest haul" in her career. Probably Burns had learned from Newfoundland folk of the sailing of an enormous fleet of merchantmen from England, escorted by ships-of-the-line, frigates and smaller men-of-war,

which was expected in Canadian waters about this time. At all events, he shaped his course so as to fall in with this fleet; and how accurate were his calculations is attested by the fact that shortly after the icebergs had been dropped out of sight the gigantic armada hove in view. Then followed days and nights of intense excitement and activity aboard the privateer, as she persistently hovered on the outskirts of the herded merchantmen, continually maneuvering to evade the watchful guard craft and seeking a favorable opportunity to pounce upon her prey.

On more than one occasion the *Snap Dragon* was furiously pursued, but, through her superior sailing qualities, she always managed to escape, each time leading the protecting war craft farther and farther away from the fleet; and then, eluding her pursuer, she would return to the fleet under cover of the night or fog and again seek for an opportunity to attack.

In one of these "side-leads" the *Snap Dragon* was nearly caught. She was being "chased off" by an unusually swift war craft. So hot was the pursuit that Burns was compelled to throw overboard many heavy articles so as to lighten his craft. In the hurry of the moment these weights had been taken only from one part of the hold, which so unbalanced her trim as to seriously impair her speed. In vain did the sailing-master endeavor to remedy the "set" of her sails. The nimble privateer was not making her rightful speed, and her pursuer was rapidly coming within gunshot. Burns seems to have been the first to discover the changes necessary to place the *Snap Dragon* in her proper trim. Taking "the boatswain and his gang" with him, he ran up "the lanyards of the rigging, made a few alterations in the sails, and in less than 15 minutes you might see the difference in the *Snap Dragon's* sailing."

Having led the pursuing war craft far enough away from the fleet, Burns evaded her and, under cover of a heavy fog, returned to the fleet, where he succeeded in cutting out 10 valuable merchantmen. "We could have taken as many more if we had had the hands to run them." As it was, the original *Snap Dragon* crew of 127 men had been so reduced by manning prizes that there now remained hardly enough to handle the privateer's own sails. Having more prisoners than he could safely accommodate, Burns released one of his prizes as a cartel in which "the prisoners to the number of 98 were placed after signing a pledge of honor not to

bear arms against the United States during the present war until regularly exchanged; all of which was done on board the *Snap Dragon* at sea, in longitude 53° W. and latitude 46° N., this 24th day of June, 1813."

"BLUFFING" OFF A CRUISER

Several days were spent in making ready for the perilous voyage back to Beaufort, for no one realized better than Burns himself the difficulties of penetrating the cordon of swift cruisers which the British Admiralty had drawn about the United States seaboard. As a matter of precaution, he packed the hold and decks of the *Snap Dragon* with goods taken out of his prizes to the value of $150,000. He then shaped his course southward, keeping only one brig, with a cargo valued at $150,000, in his company, while the other prizes were ordered to sail separately, as by this arrangement they stood less chance of recapture.

One morning, while progressing on his homeward passage, Burns discovered a strange sail ahead. He signaled his prize to keep her course while he stood ahead as if to meet the stranger, which soon was made out to be "a cruiser lying to, looking at us, trying to make out what we were." Putting on a bold front, Burns crowded on all sail in seeming anxiety to engage, whereupon the cruiser (probably undermanned) made sail to escape. This was all that Burns wanted, and he resumed his course with his prize.

As the *Snap Dragon* proceeded cautiously southward, she began to run short of provisions. The water, also, under the effects of the great heat of the southern sun, became foul. This compelled Burns to part with his prize and make all speed home. The *Snap Dragon* arrived at Beaufort on August 16, and ten days later her prize brig arrived there safely.

ENORMOUS PROFITS

In this cruise of two and a half months the *Snap Dragon* made 29 prizes. Some of them were released and some were recaptured. The value of her captures was $2,500,000, a substantial part of which was brought safely into port; so, "after paying every expense" and returning all the personal property of the British officers and sailors made prisoners, not a sailor in the *Snap Dragon* received less than $3000—a tempting remuneration for less than

three months of work. The officers' share in the prize money was proportionately greater.

Some of the articles found in the prize brig that accompanied the *Snap Dragon* home were: "Superfine and coarse cloth of all colors and sizes; cassimeres, ditto; gray, brown and olive coatings; red and white flannels, rose and striped blankets, palms, duffels, kerseys, bombazines, bombazets of all colors, satinetts and rattinets of all colors; swansdown, striped and figured; prince's, brunswick and benner cord; flushings of all colors; carpetings, cambric and cambric muslin, cotton shirtings, prints, calicoes, shawls, checked and fancy molesdown, plain and silk striped toilenets, bedford, patent and windsor cords, velveteens, elastic stockinett, web braces, cotton and silk laces, men's and women's cotton and worsted hose, dimities, love handkerchiefs, beaver gloves, fancy vestulets, sewing silks, boot cord, thread, London and Whitechapel needles, 60 casks card wire invoiced at 2200 pounds sterling, 25 tons of steel and sheet iron; and the contents of 58 packages as yet unknown."

KINDNESS TO PRISONERS

One of the English supercargoes, "a fine, gentlemanly fellow," made prisoner by Burns, claimed four cases of goods worth $4000, as his personal property. Burns promptly surrendered the cases and also gave the man $1000 in cash. Another British supercargo named Campbell proved very useful in the auction room where the prize goods were sold. For this service he received a commission. One of the purchasers claimed a package that was more valuable than the one he had actually purchased. Campbell refused to give up the package, whereupon the purchaser roundly abused Campbell and struck him. Hearing of this, Burns severely reprimanded the man for striking a prisoner and tweaked his nose—an insult to which the man meekly submitted. There was no further abuse of prisoners after that. Burns also gave Cambpell $500.

THIRD CRUISE

It was in his third and last cruise that Captain Burns engaged in a sea fight that, in many respects, was remarkable. In it occurred, probably, the only instance of that period in which one of the craft involved resorted to ramming with a degree of success. On this cruise Burns had as his officers: Benjamin D. Coakley, first lieutenant; James Guthrie, second lieutenant; Joseph Anthony, third

lieutenant; Thomas Barker, captain of marines; David Wallace, lieutenant of marines; Alexander Glover, sergeant of marines; Joseph Maires, surgeon; John Gardner, assistant surgeon; James Smith, sailing-master; Moses Horn, purser, and Israel Dyer, gunner.

At 7 o'clock on the morning of January 20, 1814, the *Snap Dragon* crossed Beaufort bar, saluted the fort, and shaped her course for the more salubrious coast of South America. After speaking a number of sails without taking a prize, and escaping several times from pursuing English cruisers, Burns, early in February, approached the equator. Here he found that the sultry heat of the tropics had fouled his water, and the men were placed on a short allowance.

Keeping a ship's supply of water pure in hot climates was one of the many difficulties navigators had to contend with in those days. Many were the instances where American seamen endured tortures more acute than the wounds of battle, in running short of water. In August, 1812, the Baltimore privateer *Globe,* Captain J. Grant (or Gavet), was in this predicament when some of her men exchanged their daily rations of rum, measure for measure, for water. While cruising off the western coast of Africa in the summer of 1814 the United States 16-gun brig *Siren,* Captain John B. Nicholson, ran short of water, and for some days the people suffered untold torments. It appears, in a private diary, that her gunner was a "foxy old fellow," who had been through this water-famine experience before. He was not popular with the crew. On this cruise he had secreted a cask of water aboard the *Siren,* which he kept under lock and key for his own use. One of the *Siren's* boys discovered where the key was kept, and on several occasions helped himself to the precious liquid and gave a quantity to his messmates. Discovering the loss, the gunner "began throwing out hints about sneak-thieving, what an unpardonable crime it was aboard a warship, and how he would just like to catch any one doing such a thing aboard the *Siren.* Of course, no one had the slightest idea what he was raving about, excepting the boys who had taken the water, the rest of the crew innocently supposing that the want of water was driving the poor man out of his senses. When the boys next attempted to visit this water cask, they found a new and stronger lock on the door."

Apparently some of the *Snap Dragon's* men thought they could steal some of the privateer's water. That they were caught is

shown by the fact that Burns, on Sunday, February 13, 1815, entered in his ledger that he had put two of his crew in irons " for introducing themselves to a water cask when the ship's company was on an allowance."

AN EXTRAORDINARY SEA FIGHT

Refilling his " breakers " at a port where the privateer touched, Burns appeared off Paramaribo, at the mouth of the Surinam River in Dutch Guiana, where, early on the morning of March 4, he descried a sail to leeward, to which he gave chase. About this moment the fort at Paramaribo began firing guns as a signal to the stranger that an enemy was at hand. Evidently the Dutch officials had recognized the *Snap Dragon* as an American war craft, and were anxious to put the approaching sail on her guard. This confirmed Burns in his belief that the stranger was either a Dutch or English vessel and that her arrival (probably with a rich cargo for Guiana) was anxiously awaited.

By 7 a. m. the *Snap Dragon* had approached near enough to make the stranger out as a large merchant ship, coppered to the bends, and while mounting 22 cannon, it was more than likely that she was manned by fewer than 20 men. As it required from five to eight men to handle one cannon in those days, Burns realized that the difference in metal was not so formidable; while, if once he could get alongside to board, his great superiority in men would enable him to carry her. Obviously the stranger appreciated this danger, and maneuvered with great skill for a considerable time to avoid boarding.

When in easy gunshot, Burns hoisted American colors and fired a gun as a signal to heave to. The stranger defiantly ran up the English flag and also fired a shot. From half-past 7 o'clock the two vessels engaged " in a regular and constant fire " for some time—the Americans persisting in their efforts to get alongside, and the English as persistently evading the maneuver. Hoping to intimidate the merchantman into surrender, Burns, at 11.30 a. m., hoisted the red flag forward and now, being close enough for musketry, he opened with his small arms.

It was 12.20 p. m., however, before the *Snap Dragon* got on the stranger's quarter, the puny privateer looking very much like a cockle-shell alongside her huge antagonist. Burns now massed his boarders in his fore rigging, ready to spring aboard the enemy's deck the instant the vessels were in contact. Perceiving the intent

of the Americans, the Englishman opened from his stern guns a fire which "injured our sails and rigging very much," and prevented the contemplated boarding.

IN A TOOTH-AND-NAIL STRUGGLE

For more than an hour after this the privateer maneuvered for another position to board, all the time keeping up a constant fire of cannon and musketry. The Englishmen "fought desperately, using round shot, grape and canister." At moments the two vessels were so close together that pistols, cutlasses and boarding-pikes came into use—and even cold shot were thrown by hand.

There was an instant when the side of the privateer chafed against the towering hull of the merchantman, and from their superior height the Englishmen hurled "stink-pots [stone jars filled with explosives], bricks and glass bottles" down on the Americans exposed on the open deck of the *Snap Dragon* below. Not having ammunition of this character with which to return the compliments, Burns demonstrated his resourcefulness. According to the account of Nat Owens, one of the *Snap Dragon's* marines, when the two vessels had sheered off a little distance from each other Burns loaded his cannon with sailmakers' needles, which, discharged through the open ports of the merchantman, proved to be painful, if not fatal, missiles. That the British were suffering heavily from the privateer's attack was shown by the fact that blood was observed running down the merchantman's black side from her lee scuppers.

At 1.30 p. m. Burns made another determined effort to board. He put his helm hard up so as to make a straight course for the merchantman. Observing this attempt, the British commander resorted to the unusual (for those days) expedient of heading his ship directly for the oncoming privateer with the intention of ramming. Burns so far avoided the collision as to receive only a slanting blow; so, instead of sinking the little *Snap Dragon,* the merchantman's fore chains caught the privateer's jibboom and bowsprit and carried those spars away.

AMERICAN BOARDERS TRAPPED

At the moment of contact a number of Americans clambered up to the Englishman's deck. Just then, however, a wave carried the vessels apart, leaving the boarders not only unsupported, but with

their retreat cut off. They prepared to sell their lives dearly, and put on such a determined front that the English master began to haul down his flag, which was at his mizzen masthead. He got it as low as the gaff, when the *Snap Dragon's* foremast, deprived of the support of the bowsprit, went by the board and fell into the water with a crash, leaving the privateer rolling helplessly in the trough of the sea.

Although the Englishman now had a substantial advantage, he realized that his first duty was to save his own ship and cargo, not to attempt the capture of the enemy's craft. Also he had suffered a heavy loss in killed or wounded, while his vessel had been seriously damaged. Therefore, he rehoisted his flag, held a parley with the Americans who had gained his deck, and, on their consenting to suspend hostilities, he permitted them to get into a boat towing at the merchantman's stern and regain the privateer. As the alternative of this proposal was fight without quarter (the surviving men in the merchantman outnumbered the boarders), the Americans consented. As soon as they left the ship, the British master made sail and escaped.

Burns now set all hands clearing away the wreckage. Most of the *Snap Dragon's* sails, running and standing rigging, foremast, main topmast, and even her colors, had been shot away. The pumps were sounded, but fortunately it was found that she was not taking in water. A jury mast was rigged, the jib reset, and by 4 p. m. the privateer was under partial sail.

The merchantman's name or casualties never became known to the Americans, but it was evident that she had received serious injuries. The Americans who had boarded her noted that a number of her crew were lying about her decks, dead or wounded. The *Snap Dragon* had four men killed and seven wounded. The former were Boatswain Thomas Green, William Burns, John Hart and Charles Nurse (colored), while the latter were Edward A. Bridgden (who lost his right arm), William Rogers, Henry Fletcher (wounded in the thigh), Theodore Stickney, Isaac Clark, Malea George and Peter George. "Thus ends an action," records Burns, "that forces us to run for some port to repair, owing to losing our mast. Had it stood, she was our prize."

Three days later, March 7, the *Snap Dragon* came hobbling into the mouth of an unfrequented river near Paramaribo. Third Lieutenant Anthony and some of the men paddled ashore on a

raft (every boat in the privateer having been smashed to pieces in the battle), got timber, and in the course of two weeks, the privateer, temporarily repaired, began her homeward voyage. On the 24th of March she captured an American vessel that had been seized by the British frigate *Cleopatra* and was in the hands of an English prize crew. On April 9 Burns anchored off Newbern, thus ending a cruise of 79 days.

CONCLUSION

If further evidence of Captain Burns' unusual ability in privateering warfare be needed, we have it in the fact that the *Snap Dragon* was captured in the first cruise she took after he relinquished her command. Having cruised from the ice-bound east coast of Greenland to the torrid heat of the equator for two years, Burns was seized with rheumatism, which incapacitated him from further sea service, so the command of the *Snap Dragon* devolved on First Lieutenant Coakley. Coakley was an able and experienced officer, thoroughly familiar with his craft, men and cruising grounds, but he lacked the genius of Burns.

Coakley sailed from Ocracoke Inlet May 28, 1814, and, running up to Nova Scotia, hovered off Halifax with a view to intercepting inward and outward bound merchantmen. On the 29th of June, he sighted a vessel that had every appearance of being a merchantman of unusual size and value. It was the British frigate *Leopard* in disguise. Apparently, Coakley exercised due caution in approaching, but he failed to penetrate a trick which Burns so frequently had guarded against. Rushing too blindly into close quarters, Coakley found himself engaged with a cruiser of vastly superior force. He made a gallant fight, and did not surrender until he had received a mortal wound, while many of the crew were dead and a larger number were wounded. The *Snap Dragon* was carried into Halifax, and afterward she was sent to England, where her survivors were confined in Dartmoor until after the cessation of hostilities.

CAPTAIN BURNS AS A STATESMAN

In his three cruises Captain Burns amassed a fortune. He retired from the sea and resumed his shipbuilding business, constructing, among other vessels, the *Prometheus,* the first steamer to ply the waters of Cape Fear River. He erected a fine residence

in Beaufort, on the site afterward occupied by the Atlantic Hotel, where he lived 22 years. In 1821 he was elected to the North Carolina House of Commons, in which he served seven terms, besides which he served five terms in the State Senate.

In his political career Burns showed that same fearlessness and humanity which characterized his conduct in the war—it being notable that of the 42 craft he captured from the English, he destroyed only one. It was Burns' fearlessness and sense of justice that cost him not only further political advancement but his fortune as well. On many issues of state-wide importance he cast his vote on the side of manifest justice, instead of self-interest. A single instance will illustrate. Owing to the rapid increase of the population in the western part of the state, the old plan of representation in the North Carolina General Assembly had become obviously unfair to the " west country " people. Although representing an eastern county, Burns repeatedly voted for a more equitable reapportionment. So grateful were the people of the newly created Yancey County that they named their county seat Burnsville in his honor—and Burnsville is the highest town above sea level in the United States east of the Rocky Mountains. In a sense, at least, the people of Yancey County paid this veteran of the sea one of the highest honors in the United States.

Retiring from politics with his fortune depleted, in 1835, Senator Burns was appointed by President Jackson keeper of the Brant Shoals Lightboat, not far from Portsmouth, N. C., which position he held to the day of his death, October 25, 1850. He was buried in the beautiful cemetery at Beaufort, under his favorite live oaks, where, to this day, one of the *Snap Dragon's* cannon guards his grave. A monument was erected to the memory of Captain Burns at Burnsville, N. C., and unveiled July 5, 1909. His only son, Owen Burns, became a captain in the United States Navy, and after service on the Atlantic, Mediterranean and Pacific stations, resigned in 1840, and died in 1869.

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ORIGIN OF U. S. SHIP *PORTSMOUTH*[1]

By Late Rear Admiral T. O. Selfridge, U. S. N.

In the year 1813, during the war with Great Britain, a French letter of marque arrived in the harbor of Boston Mass., from France, having made a remarkably quick passage. Needing some slight repairs under water, Mr. Barker, then a shipwright in Charlestown, near Boston, and subsequently a naval constructor, was engaged to make then. To effect this she was thrown out on the flats, a not unusual custom in those days, before the introduction of dry docks, and when heaving out was an operation involving much time and expense. While the repairs were in progress Mr. Barker was so forcibly struck with the great symmetry and beauty of her bottom that he requested the captain to give him her lines; which he did without reluctance. On these lines, somewhat enlarged, he built the ship of war *Frolic* for our government, which was captured shortly after sailing on her first cruise by mismanagement. After the launching of the *Frolic* Mr. Gray, an eminent and wealthy merchant of Boston, contracted with Mr. Barker to build him a vessel of the same size and form of the *Frolic* for a privateer. She went up rapidly, was launched, equipped with 22 guns, officered and manned, and was ready for a cruise against the enemy's commerce just at the period when peace was proclaimed. Her name was the *Union,* but from her great size she was called familiarly by sailors, *Billy Gray's Frigate.*

Privateering coming to an end with the peace, she was raised upon and given another deck with the view of making her an Indiaman. She sailed in the Calcutta trade from and to Boston until 1823, when she was sold to parties in New York and put in

[1] This account of the origin of the *Portsmouth,* written in 1880, was found among the private papers of the late Rear Admiral Selfridge, and was furnished through the courtesy of Rear Admiral Thos. O. Selfridge. U. S. N.

the Liverpool service. She leaked badly on the return voyage, and was lost on Long Island, probably by overrunning her reckoning. I had the pleasure of being her 3d officer on the last voyage she made to Batavia and Calcutta, and can attest to her great speed, both going from and on a wind. Her maximum speed off the wind was 14 knots, and by the wind 10½ knots; sailing seldom equalled and rarely surpassed by a vessel of her tonnage—620 tons. She came up to 9 and 10 knots more easily than any vessel I was ever in.

In 1842, when the several naval constructors were directed to propose designs for building sloops of war, Mr. Pook, Naval Constructor, in conversation with Mr. Barker on the subject, remarked to the latter "that he thought he could not do better than to take the *Union's* lines and enlarge upon them, as he had compared them with the lines of some of the best vessels in the navy and found them in close accord." Mr. Barker acted on the suggestion of Mr. Pook, and produced the *Portsmouth;* which is to-day, probably the fastest sailing vessel of her length and displacement in the world.

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PLAN OF SELECTION

By REAR ADMIRAL THOMAS O. SELFRIDGE, U. S. N. (Retired)

The present stagnation in promotion is a standing menace to the efficiency of the navy; a menace steadily increasing until it will become insupportable. It behooves the navy itself and all authority which control legislation to look the matter squarely in the face.

Selection out, never a remedy, is doomed. There remains "selection up" or the present method by seniority; a condition which, quoting the chief of the bureau of navigation, will retire the present ensign the day he receives his commission as a rear admiral.

Convinced many years ago that "selection up" as in other navies was the only remedy, I have given the subject long and careful study, but in all plans I was always confronted with the specter of favoritism, until I formulated the idea of using the personal equation and to have the selection made by officers in the grade next above the one from which selections were to be made.

I admit this is a radical method which I have developed, but, if carefully considered, will be found entirely practical, and it abolishes the lurking fear of favoritism.

Other things being equal, I believe in the claim of seniority and would limit the selection to one-half the vacancies of any one year, leaving it to the age limit to preserve the upper grades from the danger that now threatens them. I would also recognize that the efficiency of the navy depends, in a great degree, upon the professional ability, zeal, and vigor of the junior grades by permitting all officers in good standing shut out by the age limit to be placed upon an active reserve list, with the additional promotion of one grade.

The following is the plan of which, in my opinion, $500,000 will cover the increased expense of its operation—surely a small price for the necessary and increased efficiency of the service:

Any plan for promotion by selection requires all age limit for the several grades, which I place for lieutenants at 40 years, lieutenant commanders at 45, commanders at 50, captains at 55. I propose that one-half of all vacancies shall be filled by seniority. subject to the age limit, and one-half by selection.

To provide the latter class the Navy Department on the 1st of April of each year shall anticipate the vacancies that shall occur in the grades of lieutenant commander, commander, and captain. It shall address a circular letter to each lieutenant commander, giving the number of vacancies that will occur by the 1st of the following July, requiring him to send confidentially and without reasons a list of such lieutenants who have had four years' sea service in their grade and whom he considers best qualified for promotion. A similar letter to be sent to each commander giving the number of vacancies that will take place by July 1st, requiring him to send confidentially and without reasons a list of such lieutenant commanders who have had not less than two years' sea service, whom he considers best qualified for promotion. A like letter to each captain giving the number of vacancies by July 1st and requiring him to forward confidentially and without reasons a list of such commanders who have seen not less than two years' sea service in their grade whom he considers best qualified for promotion. I stop selection for promotion at the grade of captain, but require every captain shall have seen two years' active sea service in command of a battleship to be eligible for promotion to the grade of admiral. When these several lists (to be strictly confidential) are received at the Navy Department, a board of senior officers shall be assembled who shall study the lists and select those officers who have the most frequent mention in the several reports and submit such to the President through the Secretary of the Navy for his approval and action. It will be observed that, though only one-half of the vacancies are filled by selection, the plan requires that officers shall fill out the names of the entire number of vacancies in order to cover any shrinkage in the list presented by the board to the President. Officers in good standing, retired for falling under the age limit only, shall be placed on an active reserve list with an increase of one grade. They can be employed on shore duty, but not sea duty, except in time of war. When they reach the age of 62, they are retired under the present rules of retirement, and further rules to make the plan effective can be made by the Navy Department.

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PURE SELECTION, OR SELECTION UP, *VS.* SELECTION OUT

By Rear Admiral H. O. Dunn, U. S. Navy

I am not a believer in "selection up." Assuming that any such method adopted will bring the best officers to the top (a very doubtful assumption), certain inevitable results will ensue.

Constant and frequent changes of seniority will take place in all grades.

So long as human nature remains the same, and naval officers are quite as human as other people, this will cause a deep-seated and unending feeling of dissatisfaction.

It will be difficult to make the officer who is jumped believe in the superior qualities of the person who is put ahead of him.

A disgruntled and discontented status will follow and continue so long as the submerged officer remains in the service.

A few officers, the lucky selected, will be happy and quite contented; the great majority will feel sore and disheartened. Result, unhappy ships, which spells inefficiency.

My experience of 43 years in the service has confirmed my early belief that no ship can be truly efficient unless the officers are contented and happy.

Under any system of marking is it possible for the officers themselves to select the best for advancement?

I have my doubts on this phase of the subject. It is much safer and considerably surer, to select out the weak ones than it is to pick winners.

An officer may have an irreproachable record, but who can tabulate and arrange in mathematical order that indefinable quality which has been called, "the fighting edge"? History has furnished us many surprises on this point.

In the place of "pure selection," I am emphatically a believer in "selection out."

There are many reasons in favor of "selection out." In the first place the people who go out take their troubles with them, and the even surface of the remaining personnel remains undisturbed both in seniority and content.

The process of "selecting out" is easier and less doubtful than "selecting up."

The remaining average of each grade is higher after every "selection out," and in such a large corporation as the navy we must deal in averages. The efficiency of the navy depends upon the great average ability of officers, not upon a few brainy individuals. The chain must have links equally good; eliminate the weak ones and the result is obtained.

I believe the great majority of officers in the service would prefer "selection out," it being understood that one or the other *must* obtain. It is a great mistake to assume that the service is opposed to "plucking." From my knowledge of the question I would estimate that at least 80 per cent of the line officers believe in "selection out."

The department has already in its hands, and always has had, the power of selection—selection for duty—and therein lies the crux of the whole question. Each officer's record is an open book for the department to consider and from which to choose the best fitted officer for the performance of any duty. This being so, why adopt a doubtful expedient to arrive at something we already possess, especially when the plan suggested is bound to cause heartburnings and discontent never to be effaced?

In a proposed bill based on "pure selection" the summary is stated as follows:

1. That the best men in the navy reach the top.
   Very problematical, to say the least.
2. That they reach command and flag rank early in life.
   So they do by "selection out."
3. That officers have adequate experience in each grade before promotion to the next.
   This is not dependent upon "pure selection." The same results can be obtained by "selection out."
4. That the spirit of competition is fully utilized.
   Not more so than in "selection out."

5. That political and personal influence are entirely excluded from promotion.

   Is it? It is impossible to avoid personal influence so long as officers who do the selecting are human beings.

6. That promotion is dependent absolutely on professional attainments.

   The same obtains in " selection out."

7. That officers not fitted for higher positions are utilized in the lower grades as long as they are efficient therein.
8. That retirement is only for physical disability and age in grade.
9. That military duty is not performed to the detriment of the fighting efficiency of the fleet.

   These three very good results stated in (7), (8), and (9), can be obtained by any kind of a proper bill, whether based on " pure selection " or " selection out."

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U. S. NAVAL INSTITUTE, ANNAPOLIS, MD.

FINDING THE COURSE IN GREAT CIRCLE SAILING

By G. W. LITTLEHALES

Importance attaches to methods of finding the series of courses that are necessary to be steered in pursuing a great circle route, because the criterion of minimum duration of passage is the great circle distance.

It has been frequently pointed out that the rhumb line, although appearing as a straight line on the Mercator chart and thus giving a false idea that it represents the shortest route, is in reality a roundabout track, and that it is only when a vessel's course is shaped by the great circle passing through the places of departure and destination that she has the shortest possible distance to make and heads for her port as if it were in sight throughout the voyage.

In the present generation, with the former meteorological control of the vessel's route outgrown by modern motive power and with convenient means supplied for determining both latitude and longitude at sea, if the principles of great circle sailing are not applied, it is not from the failure to recognize that the shortest distance between any two places on the earth's surface is the distance along the arc of the great circle passing through them, nor that the great circle course is the only true course and that the courses in Mercator sailing and parallel sailing are circuitous; but from the want of concise and adequate methods of rendering these benefits readily available.

The existing charts of the several oceans, constructed on the gnomonic projection, provide for laying down a great circle track by simply drawing a straight line from the point of departure to the point of destination. If a track so drawn be extended into the tropics and a point on this extension be regarded as the point bound to, then the great circle course at the latitude of the ship

may be taken from the azimuths tabulated in the solar azimuth tables by merely regarding the latitude of the point bound to as declination and the difference of longitude between the ship and the point bound to as the hour angle. And, if the extension of the track were always made to the equator or to any definite parallel of latitude within the tropics, then, in finding the great circle course, it would never be necessary to refer to any part of the azimuth tables other than that relating to a declination equal to the latitude of the definite parallel so chosen.

This will be perfectly clear if finding the azimuth be viewed as a terrestrial measurement in connection with which the observed celestial body is considered to be projected vertically downward on the surface of the earth—that is to say, if the azimuth-angle be regarded as the angle whose apex is formed at the geographical position of the observer between his meridian and the great circle arc passing through his geographical position and the geographical position of the observed celestial body. For it will then become commonplace to regard any value of the azimuth as applying not only to the position of the particular celestial body observed, but as applying besides to all geographical positions of which the great circle passing through the geographical position of the observer and the geographical position of the observed celestial body is the locus; and, since every great circle of the earth, except the equator itself, crosses the equator, there will always be a point on the equator whose true bearing from the observer is the same as the azimuth of any celestial body or the course to any point of destination. The fact that this relation exists and that the great circle sailing charts on the gnomonic projection afford convenient means for finding the difference of longitude or hour-angle between the meridian of the ship and the meridian of the point of intersection with the equator of the great circle passing through the ship and the point bound to or the port of destination gives rise to the plan herein proposed of supplying on the margin of the chart an abridged table of true bearings embracing only so much of the azimuth tables as relates to 0° of declination.

Under this plan of procedure, which has been summarized in the following rules on the face of the accompanying chart of the North Atlantic Ocean, great circle courses can be found at a glance to within a few minutes of arc, whereas they could not always be found hitherto, from the chart itself, as closely as courses can be steered.

When either the latitude of the ship or the latitude of the destination is higher than 60°, there will be instances arising in which even the most ample of the gnomonic charts of the oceans will not suffice to extend the required great circle track to its intersection with the equator. In such cases resort may be made to a gnomonic chart known as Godfray's great circle sailing chart, in which the geographical pole has been chosen as the point of tangency of the plane of projection. In this, however, since the parallels of latitude are represented by a series of concentric circumferences whose radii are equal to $r \times$ cotangent latitude, where r is a length representing the radius of the earth, the equator cannot be drawn because the cotangent of 0° is an infinity; and hence the intersection of the straight line representing the great circle track must be sought on parallels of latitude near the equator, and, with the positions thus found, be transferred to one of the usual charts for the purpose of finding its intersection with the equator.

RULES

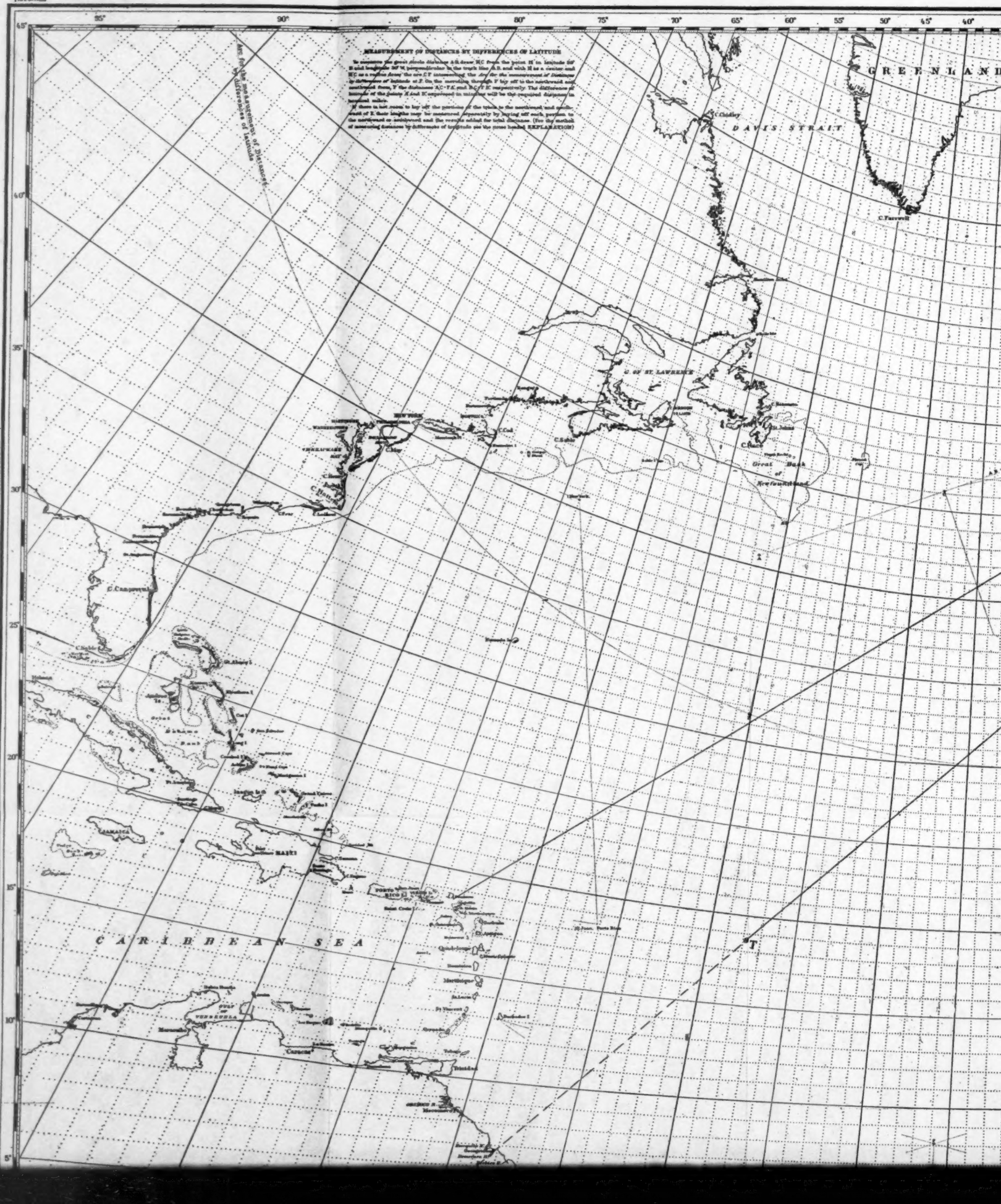
Draw a straight line between the points of departure and destination (PD), and produce this line until it intersects the equator, or, if the line produced does not intersect the equator within the limits of the chart, as in the case presented of the great circle track between the Scilly Islands and Sombrero, plot the latitude of the point of departure on any selected meridian (S) and the latitude of the point of destination on a meridian (T), whose difference of longitude from the selected meridian is equal to the difference of longitude between the points of departure and destination, and, having connected S and T by a straight line, produce this line until it intersects the equator. Note the difference of longitude between the intersection thus found on the equator and the selected meridian on which the latitude of the point of departure is plotted, and, in the marginal tables, opposite the difference of longitude, if less than 90°, and under the latitude of the point of departure, will be found the true bearing toward the intersection of the track with the equator, reckoned from the north pole in north latitude and from the south pole in south latitude through 180° toward the eastward or westward, according as the intersection of the track with the equator lies to the eastward or westward of the meridian on which the latitude of

the point of departure has been plotted. If the difference of longitude is greater than 90°, enter the marginal tables with the remainder obtained by subtracting it from 180° and the remainder obtained by subtracting the tabulated quantity from 180° will give the true bearing toward the intersection of the track with the equator.

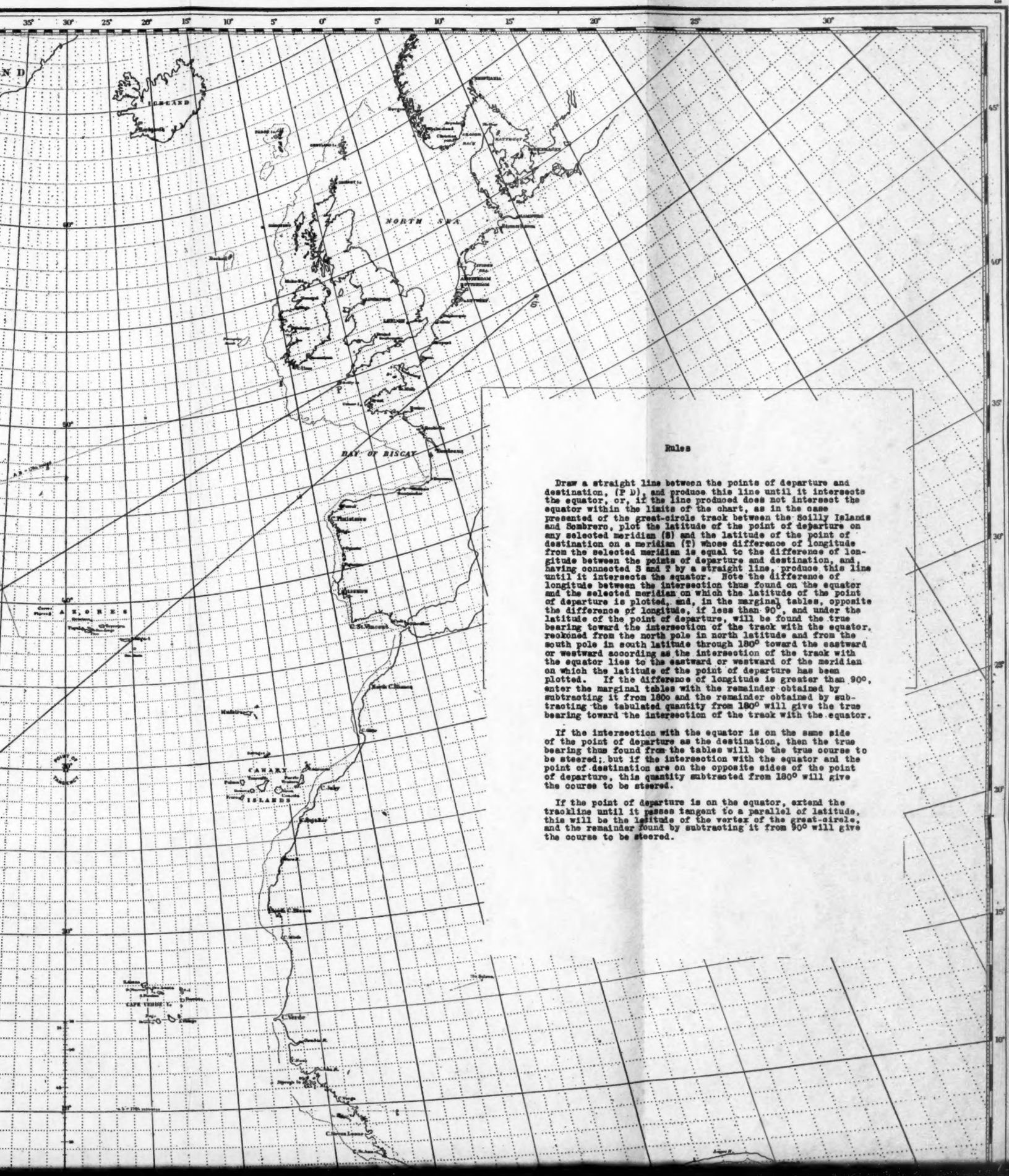
If the intersection with the equator is on the same side of the point of departure as the destination, then the true bearing thus found from the tables will be the true course to be steered; but if the intersection with the equator and the point of destination are on the opposite sides of the point of departure, this quantity subtracted from 180° will give the course to be steered.

If the point of departure is on the equator, extend the track line until it passes tangent to a parallel of latitude; this will be the latitude of the vertex of the great circle, and the remainder found by subtracting it from 90° will give the course to be steered.

GREAT CIRCLE SAILING CHART C



T OF THE NORTH ATLANTIC OCEAN

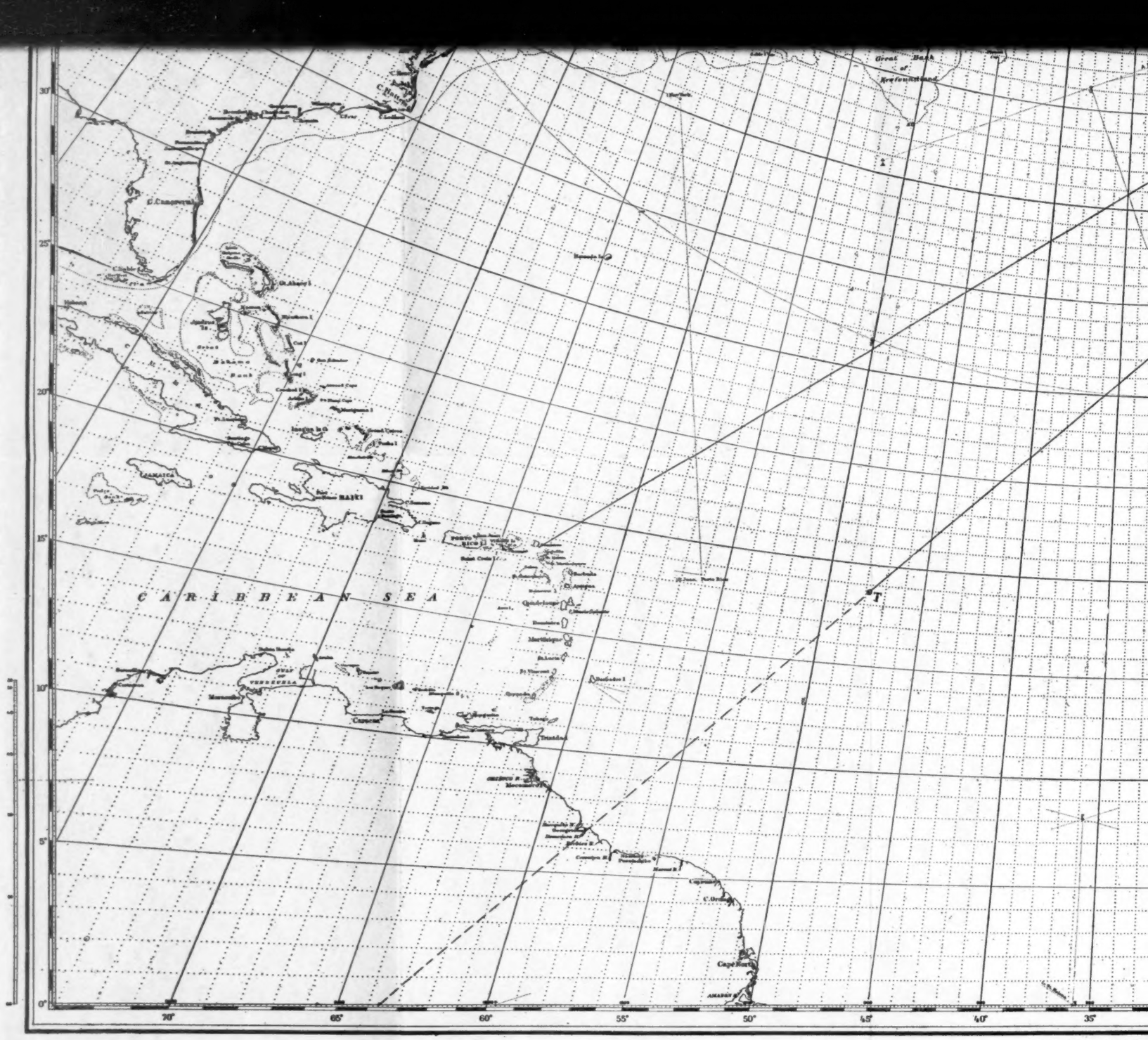


Rules

Draw a straight line between the points of departure and destination, (P D), and produce this line until it intersects the equator, or, if the line produced does not intersect the equator within the limits of the chart, as in the case presented of the great-circle track between the Scilly Islands and Sombrero, plot the latitude of the point of departure on any selected meridian (S) and the latitude of the point of destination on a meridian (T) whose difference of longitude from the selected meridian is equal to the difference of longitude between the points of departure and destination, and, having connected S and T by a straight line, produce this line until it intersects the equator. Note the difference of longitude between the intersection thus found on the equator and the selected meridian on which the latitude of the point of departure is plotted, and, in the marginal tables, opposite the difference of longitude, if less than 90°, and under the latitude of the point of departure, will be found the true bearing toward the intersection of the track with the equator, reckoned from the north pole in north latitude and from the south pole in south latitude through 180° toward the eastward or westward according as the intersection of the track with the equator lies to the eastward or westward of the meridian on which the latitude of the point of departure has been plotted. If the difference of longitude is greater than 90°, enter the marginal tables with the remainder obtained by subtracting it from 180° and the remainder obtained by subtracting the tabulated quantity from 180° will give the true bearing toward the intersection of the track with the equator.

If the intersection with the equator is on the same side of the point of departure as the destination, then the true bearing thus found from the tables will be the true course to be steered; but if the intersection with the equator and the point of destination are on the opposite sides of the point of departure, this quantity subtracted from 180° will give the course to be steered.

If the point of departure is on the equator, extend the trackline until it passes tangent to a parallel of latitude, this will be the latitude of the vertex of the great-circle, and the remainder found by subtracting it from 90° will give the course to be steered.



small corrections
From Mariners to Mariners, 1951-52
From other sources, HO Pub. 216, 1951

Washington, D.C., published Aug...
under the authority of the S...

LATITUDE

Diff. Long.	0°	1°	2°	3°	4°	5°	6°	7°	8°	9°	10°	11°	12°	13°	14°	15°	Diff. Long. h. m.
° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′	h. m.
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75 00	90 00	90 00	90 00	90 00	90 00	90 00	90 00	90 00	90 00	90 00	90 00	90 00	90 00	90 00	90 00	90 00	90 00	V 00
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50 00	90 00	90 00	90 00	90 00	90 00	90 00	90 00	90 00	90 00	90 00	90 00	90 00	90 00	90 00	90 00	90 00	90 00	III 00
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5 00	90 00	90 00	90 00	90 00	90 00	90 00	90 00	90 00	90 00	90 00	90 00	90 00	90 00	90 00	90 00	90 00	90 00	20
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LATITUDE

Diff. Long	15°	16°	17°	18°	19°	20°	21°	22°	23°	24°	25°	26°	27°	28°	29°	30°	Diff. Long. h. m.
° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′	h. m.
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87 30	90 00	90 00	90 00	90 00	90 00	90 00	90 00	90 00	90 00	90 00	90 00	90 00	90 00	90 00	90 00	90 00	30
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15 00	90 00	90 00	90 00	90 00	90 00	90 00	90 00	90 00	90 00	90 00	90 00	90 00	90 00	90 00	90 00	90 00	40
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10 00	90 00	90 00	90 00	90 00	90 00	90 00	90 00	90 00	90 00	90 00	90 00	90 00	90 00	90 00	90 00	90 00	I 00
7 30	90 00	90 00	90 00	90 00	90 00	90 00	90 00	90 00	90 00	90 00	90 00	90 00	90 00	90 00	90 00	90 00	10
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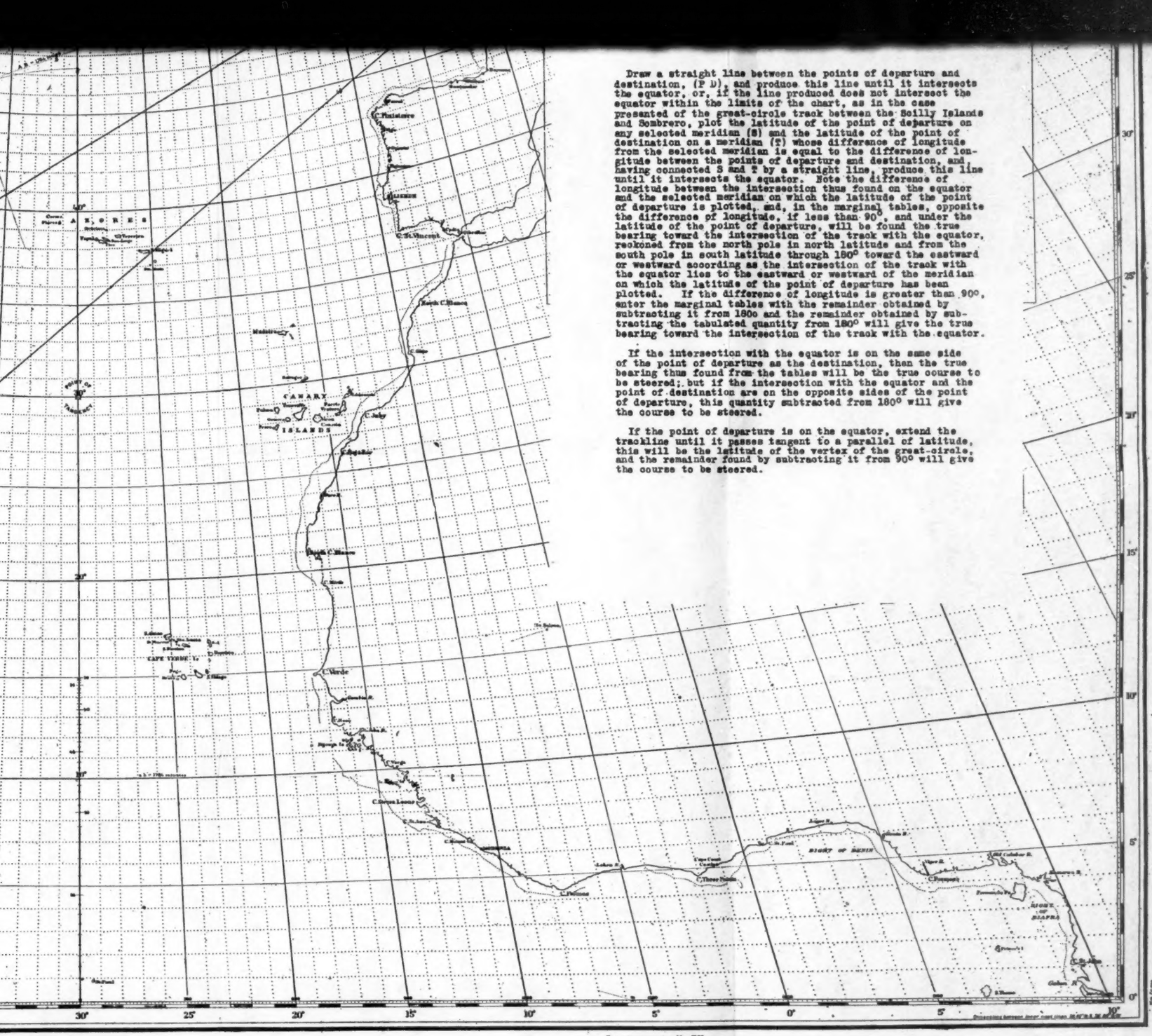

Draw a straight line between the points of departure and destination, (P D), and produce this line until it intersects the equator, or, if the line produced does not intersect the equator within the limits of the chart, as in the case presented of the great-circle track between the Scilly Islands and Sombrero, plot the latitude of the point of departure on any selected meridian (S) and the latitude of the point of destination on a meridian (T) whose difference of longitude from the selected meridian is equal to the difference of longitude between the points of departure and destination, and, having connected S and T by a straight line, produce this line until it intersects the equator. Note the difference of longitude between the intersection thus found on the equator and the selected meridian on which the latitude of the point of departure is plotted, and, in the marginal tables, opposite the difference of longitude, if less than 90°, and under the latitude of the point of departure, will be found the true bearing toward the intersection of the track with the equator, reckoned from the north pole in north latitude and from the south pole in south latitude through 180° toward the eastward or westward according as the intersection of the track with the equator lies to the eastward or westward of the meridian on which the latitude of the point of departure has been plotted. If the difference of longitude is greater than 90°, enter the marginal tables with the remainder obtained by subtracting it from 180° and the remainder obtained by subtracting the tabulated quantity from 180° will give the true bearing toward the intersection of the track with the equator.

If the intersection with the equator is on the same side of the point of departure as the destination, then the true bearing thus found from the tables will be the true course to be steered; but if the intersection with the equator and the point of destination are on the opposite sides of the point of departure, this quantity subtracted from 180° will give the course to be steered.

If the point of departure is on the equator, extend the trackline until it passes tangent to a parallel of latitude, this will be the latitude of the vertex of the great-circle, and the remainder found by subtracting it from 90° will give the course to be steered.

...had Aug. 1892, at the Hydrographic Office,
...of the SECRETARY OF THE NAVY.

Extensive corrections May, 1907

No. 1280

LATITUDE

Diff. Long.	30°	31°	32°	33°	34°	35°	36°	37°	38°	39°	40°	41°	42°	43°	44°	45°	Diff. Long. Pt.	m.
° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′		
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87 30	91 15	91 17	91 20	91 22	91 24	91 26	91 28	91 30	91 32	91 34	91 36	91 38	91 40	91 42	91 44	91 46		30
85 00	92 30	92 35	92 39	92 44	92 48	92 52	92 57	93 01	93 05	93 09	93 13	93 17	93 21	93 25	93 29	93 33		00
82 30	93 45	93 53	93 58	94 06	94 13	94 19	94 25	94 32	94 38	94 44	94 50	94 56	95 02	95 08	95 14	95 19		30
80 00	95 02	95 11	95 20	95 29	95 36	95 47	95 55	96 03	96 12	96 20	96 28	96 36	96 44	96 51	96 58	97 05		00
77 30	96 19	96 31	96 42	96 53	97 04	97 15	97 26	97 36	97 46	97 57	98 07	98 17	98 27	98 36	98 45	98 53		30
75 00	97 36	97 51	98 05	98 18	98 31	98 44	98 57	99 10	99 22	99 34	99 46	99 58	100 09	100 20	100 31	100 41	V	00
72 30	98 58	99 14	99 29	99 45	100 00	100 15	100 30	100 45	100 59	101 13	101 27	101 41	101 55	102 08	102 21	102 34		30
70 00	100 19	100 37	100 55	101 13	101 30	101 48	102 05	102 21	102 38	102 54	103 10	103 26	103 41	103 56	104 11	104 26		00
67 30	101 42	102 02	102 23	102 43	103 02	103 23	103 41	104 00	104 18	104 37	104 55	105 12	105 30	105 46	106 03	106 20		30
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62 30	104 33	105 01	105 25	105 50	106 14	106 37	107 01	107 24	107 46	108 08	108 30	108 51	109 12	109 33	109 53	110 13		30
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27 30	129 06	130 18	131 59	132 56	133 53	134 48	135 41	136 33	137 24	138 13	139 01	139 48	140 34	141 19	142 03	142 46		30
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DISCUSSION

Brood of the Constitution

(See Page 125, Whole No. 161)

Park Benjamin.—That is a good story which Mr. Morgan tells about the "Brood of the *Constitution*," but it has one small defect; he has mistaken the "Brood."

The *Constitution* came to Annapolis in 1859 to replace the *Plymouth*, aboard which ship the entering class of that year had been quartered, because the buildings were too small to accommodate all the midshipmen. The class of 1860, it is true, began its career on the old vessel, but was removed when it became necessary to refit her to defend the station against a threatened Confederate attack. After General Butler arrived with his troops, she was hauled out into the bay, and on April 25, 1861, she sailed for Newport, arriving there on May 9. In that month, all of the midshipmen except the fourth class (1860 plebes) were ordered into active service. Those remaining lived in Fort Adams through the summer of 1861, drilling occasionally on the *Constitution* which was anchored off the fort, and subsequently moored at Goat Island. The entering class of 1861, after a short stay on board of her were transferred with the new third class to the *Atlantic House* in Newport, which had been somewhat hurriedly prepared as shore quarters.

The first class that was regularly assigned to the *Constitution* for the entire year was the entering class of 1862. There was not only no room for that class in the *Atlantic House*, but it was established policy to keep the class in a quasi-afloat condition. It was drilled at the ancient spar deck guns of the *Constitution*, sent over the mast-heads as soon as hammocks were up and exercised aloft in loosing and furling the mizzen topsail. Hammocks were slept in, the mess tables were set on the berth deck, and study hours were spent at the long rows of desks which lined both sides of the gun deck, in front of which the "mates" constantly walked looking out for delinquencies. A gangway connected the ship to the island, and some miserable sheds were erected there in which the recitations were held. The entering classes of '63 and '64 followed '62 under precisely the same conditions.

The youngsters who lived aboard ship had little or nothing to do during most of the year with the three classes on shore. They had their own cadet officers and drilled in archaic infantry tactics on the bleak and wind-swept Goat Island—whereon there were then no buildings except the "store," the recitation sheds, the remains of the old fort and the light-house. The instructors—all civilians—came over in the "Fanny," a puffy little tug of-all-work—weather permitting.

In the spring, infantry battalion drills were held in the open pasture lots near the Cliff, general quarters on board the *Macedonian* and exercises aloft on the *Marion,* and the practice cruise on these vessels (to which were added at times the yacht *America,* the gunboats *Marblehead* and *Saco* and the *Dale*), followed as usual—the June examination.

In view of the foregoing, I am somewhat at a loss to perceive why the entering class of 1860 should be singled out as the "Brood of the *Constitution.*" It was not the first class to live on board, for that was the entering class of 1859. It was not the first class to be assigned to the ship after she became a regular division of the academic quarters, so to speak, for that was the entering class of '62. The entering class of '63 and '64 were aboard of her for their entire fourth class years; and even after we went back to Annapolis, '64 remained on her. The entering class of '65 were quartered on the *Santee,* and is the only class which started its academic existence on that craft of gruesome memory. Then followed on the *Constitution* '66, '67, and finally '68—the last class to live on the famous old vessel, then in charge of Lieut. Commander George Dewey. Three years later the *Constitution* was taken from Annapolis—where she belongs—made a voyage to Europe, where she tried to ram the cliffs of Dover—probably through some ancient instinct of antagonism—and now is tied up in Boston, where she has no business to be at all.

Now bearing in mind that both before the *Constitution* left Annapolis and after she returned, there was no such segregation of her midshipmen as there was in Newport, for the whole battalion at Annapolis worked together, it seems to me that if any group is entitled to be called her "brood" it is that which includes the entering classes of '62, '63 and '64. In fact with all due deference to Mr. Morgan, I am unable to see how '60's brief sojourn aboard, for part of a year, under peculiarly disturbed conditions warrants the admission of '60 into that "brood" at all. Was not the old ship peculiarly our "home"? We had no attachment to or for the Atlantic Hotel. Didn't we execute, "serve, vent and sponge" with ancient weapons on wooden carriages no different from those with which the ship sank the *Guerrière* in years no further distant *then* than *"then"* is from to-day? Didn't we gaze in deepest awe upon "Charley" Stewart when he came aboard once more to visit the old craft wherewith he had thrashed the *Cyane* and *Levant?* And with him, Farragut and Goldsborough and Paulding, all comrades in the war of '12. And lots of other memories which I don't dare to recall here lest I be rightly charged with too much reminiscing.

No—we, the plebes of '62, '63 and '64, are the "Brood of the *Constitution,*" for we had her all to ourselves, three miles away from the rest of the school. And '62 and '63 are perhaps even a shade better qualified then '64, for when the latter zealous young officers arrived (look at their picture in my "Shakings"), the *Constitution* was bedizened with the new-fangled, one-starred pennant, suggestive only of brigadier generals, while over us the huge and many starred swallow-tail of the old commodores flew proudly from the main.

U. S. NAVAL INSTITUTE

SECRETARY'S NOTES

Annual Dues

The annual dues for 1916 became payable on January 1, 1916. It is suggested that dues be paid in lump sums covering a period of two to five years; this method of payment has advantages for members as well as for the Institute and is practised by a number of members, both regular and associate. Response to this notice will save the Institute a considerable sum in stationery and postage. Beginning January 1, 1916, members residing abroad permanently or for any length of time will be charged postage at the rate of fifty cents a year.

Special Notice

It is believed that the scope of usefulness of the PROCEEDINGS to members of the Institute can be increased and all members are invited to assist in this work. Should any topic occur to you on which you think an article could well be written, or on which you would like to read one, send such topic to the Secretary and Treasurer, together with such explanation or comment as may appear desirable in order that the intent of the suggestion may be clearly understood. The Institute is desirous of obtaining good "sea yarns" for publication. It is hoped that anyone who can spin such a yarn will submit it.

References

Attention is invited to the following articles which have appeared in the pages of the PROCEEDINGS during the past two years; they treat of subjects which closely concern Naval War College work; a perusal of them should prove profitable:

1914

War and Policy. By Captain J. S. McKean, U. S. N.; page 1, Whole No. 149, June, 1914.

Moral Training in Preparation for War. By Charles M. Bakewell; page 157, Whole No. 149, January, 1914.

The Great Lesson from Nelson for To-day. By Lieut. Commander D. W. Knox, U. S. N., P. E., page 295, Whole No. 150.

Naval Policy as it Relates to the Shore Establishment and the Maintenance of the Fleet. By Captain John Hood, U. S. N., H. M., 1914; page 319, Whole No. 150, March, 1914.

Details of Navy Department Administration: Navy Department Policies. By Lieut. Commander N. L. Jones, U. S. N.; page 377, Whole No. 150, March, 1914.

Military Preparedness. By Naval Constructor Richard Gatewood, U. S. N., H. M., 1914; page 631, Whole No. 151, May, 1914.

What Should be the Relations Between Battle and Reserve Fleets. By Captain W. S. Sims, U. S. N.; page 727, Whole No. 151, May, 1914.

Old Principles and Modern Applications. By Dudley W. Knox, U. S. N., H. M., 1914; page 1009, Whole No. 152, July, 1914.

The Battle of the Sea of Japan: Translation Japanese General Staff Report. By Captain W. T. Hoadley, U. S. Marine Corps; page 961, Whole No. 152, July, 1914.

Some Foreign and Other Views of War and the Study and Conduct of War. By Captain Albert Gleaves, U. S. N.; page 1301, Whole No. 153, September, 1914.

Strategic Problems and Their Solution. By Captain R. von Labres, I. G. N. Translated by Surgeon J. F. Leys, U. S. N.; page 1409, Whole No. 153, September, 1914.

1915

Employment of Torpedo Vessels in Night Search. Translation. By Lieut. Commander W. N. Jeffers, U. S. N.; page 89, Whole No. 155, February, 1915.

Extracts from Mahan's Naval Strategy. By Lieutenant W. T. Lightle, U. S. N.; page 155, Whole No. 155, February, 1915.

The Rôle of Doctrine in Naval Warfare. Prize Essay. By Commander Dudley W. Knox, U. S. N.; page 325, Whole No. 156, April, 1915.

Naval War College Principles and Methods Applied Afloat. By Captain W. S. Sims, U. S. N.; page 383, Whole No. 156, April, 1915.

The Work Ahead of Naval Aviation. Lieutenant R. C. Saufley, U. S. N.; page 505, Whole No. 156, April, 1915.

An Air Fleet, Our Pressing Naval Want. By Commander T. D. Parker, U. S. N.; page 709, Whole No. 157, June, 1915.

The Estimate of the Situation. By Rear Admiral Austin M. Knight, U. S. N.; page 765, Whole No. 157, June, 1915.

The Control of Fleets in Action. By Lieutenant H. H. Frost, U. S. N.; page 1053, Whole No. 158, August, 1915.

Naval Scouts. By Commander Ralph Earle, U. S. N.; page 1099, Whole No. 158, August, 1915.

Peace or War? By Commander A. W. Hinds, U. S. N.; page 1409, Whole No. 159, October, 1915.

Battle Tactics. By Lieutenant R. A. Dawes, U. S. N.; page 1873, Whole No. 160, December, 1915.

Bureau of Information The Institute offers its services as a "Bureau of Information" on professional questions and will endeavor to obtain replies from the best qualified sources. Those "Questions and Answers" which are suitable for purposes of general information, will appear in the PROCEEDINGS. It is suggested that knotty questions which come up in professional examinations for promotion may well be submitted to this department.

Membership Since March 15, 1916, 24 regular and 23 associate members have joined the Institute. The following members have died:

Commander T. C. Fenton, U. S. Navy.
Midshipman P. L. Northern, U. S. Navy.
Mr. Frank J. Symmes.

Notice Whole Nos. 145, 147, 149 and 155 of the PROCEEDINGS (March, 1913, September, 1913, January-February, 1914, and January-February, 1915) are exhausted; there are so many calls for single copies of these numbers that the Institute offers to pay for copies thereof returned in good condition at the rate of 25 cents per copy.

Address of Members Members, especially those on the retired list, and civilians are urged to keep the Secretary and Treasurer informed of the address to which PROCEEDINGS are to be sent, and thus insure their receipt.

Book Department The Institute Book Department will supply any obtainable book, of any kind, at retail price, postage prepaid. The trouble saved the purchaser through having one source of supply for all books, should be considered. The cost will not be greater and sometimes less than when obtained from dealers. Bills will be rendered upon delivery of books.

Non-receipt of Proceedings Members and subscribers are urged to notify the Secretary and Treasurer promptly of the non-receipt of PROCEEDINGS, in order that tracers may be started. The issue is completed by the 10th of the even numbered month.

Reprints of articles

The attention of authors of articles is called to the fact that the cost to them of reprints other than the usual number furnished, can be greatly reduced if the reprints are struck off while the article is in press. They are requested to notify the Secretary and Treasurer of the number of reprints desired when the article is submitted.

Notice to Newsdealers

The discount to newsdealers is now 10 per cent, instead of the 25 per cent heretofore allowed on subscriptions.

The edition of "The Elastic Strength of Guns," by the late Professor P. R. Alger, U. S. Navy, printed under date of 1906, being exhausted, the opportunity offered by the necessity of its again going to press was utilized to add two chapters, some twenty pages in all, of descriptive matter relating to gun design. A general discussion of the factors entering into gun design, their interrelations, co-ordination with the text, and their final adjustments, together with the results of the actual computations for the 12-inch 50 caliber gun and a diagram showing its pressure and strength curves have thus been included in the 1916 edition. These chapters are the work of Lieutenant (j. g.) R. K. Turner, U. S. Navy, a post graduate student in Ordnance, now at the Naval Gun Factory.

First Honorable Mention Essay

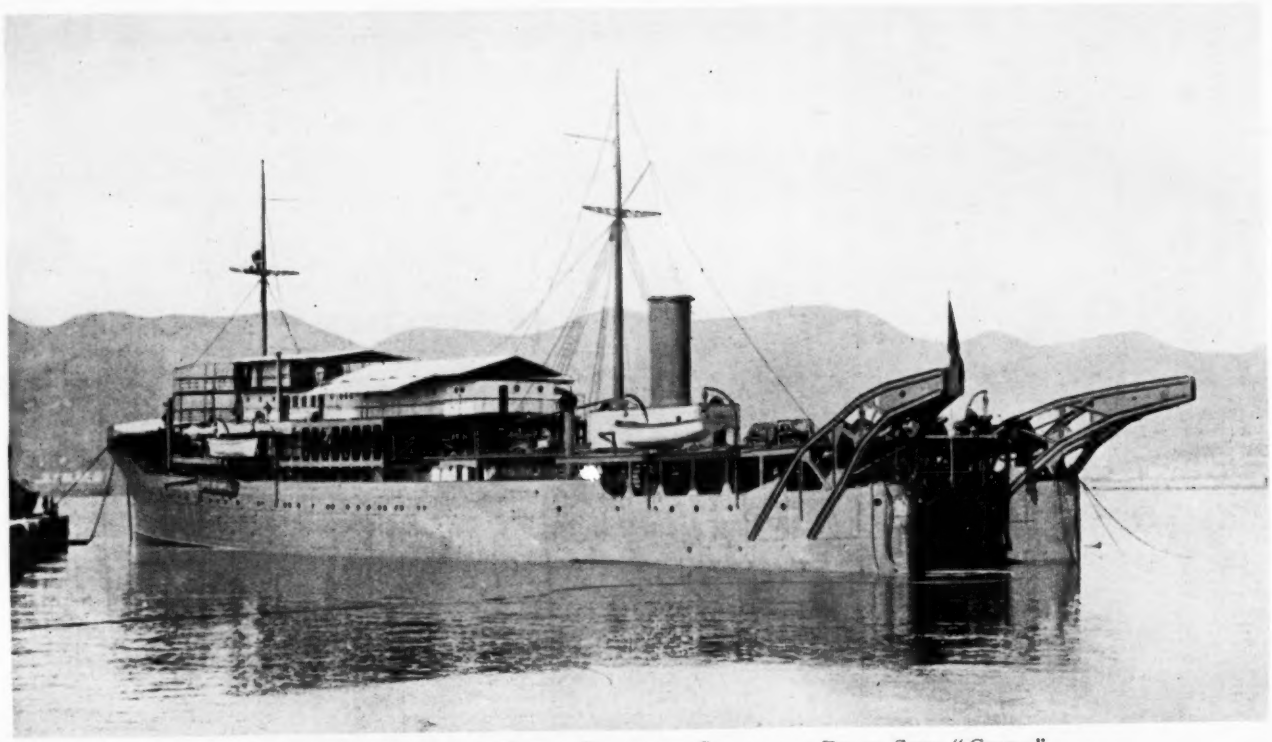
It is announced with regret that it is impossible to publish the article, "Naval Personnel" (First Honorable Mention, 1916), by Lieut. Commander J. K. Taussig, U. S. N., since the Navy Department has refused permission.

Journal of the United States Artillery

By arrangement with the manager of the Journal of the U. S. Artillery, we offer to members of the U. S. Naval Institute other than officers of the Coast Artillery, U. S. Army, a reduced rate on subscriptions to the Journal of the United States Artillery, as follows:

United States, Cuba, and Mexico, $1.75; Canada, $2.00; other countries, $2.25; and club rates to subscribers to the PROCEEDINGS, other than officers of the Coast Artillery, U. S. Army, as follows: United States, Cuba, and Mexico, $4.50; Canada, $5.00; other countries, $5.50. Good only on new or renewal subscriptions, when sent to the same address.

ANNAPOLIS, MD., May 16, 1916.



THE BRAZILIAN DIESEL-ENGINE-PROPELLED SUBMARINE DEPOT SHIP "CEARA"

PROFESSIONAL NOTES

Prepared by LIEUTENANT C. C. GILL, U. S. Navy

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NAVAL POWERS

AUSTRIA

VESSELS BUILDING

Name	Displacement	Speed	Armament	Builders	Remarks
Battleships					
Ersatz Mon'ch	24,500	22½	10 14-in.	Trieste	Laid down, 1914
" Budapest	24,500	22½	same	"	" " 1914
" Wien....	24,500	22½	same	Fiume	" " 1914
" Hapsburg	24,500	22½	same	Trieste	" " 1915

VESSELS BUILDING IN JULY, 1914, AND NOW COMPLETED

1 Battleship					
Szent Istvan..	20,010	20	12 12-inch	....	Completed in 1914
5 Light Cr'sers					
Saida class....	3,454	27	9 4.1-in., 2 6-pdrs.	....	Completed in 1914-15

Note.—Approximately 24 torpedo boats and six submarines were building in July, 1914. Official information regarding naval matters being unobtainable since the outbreak of war, it may be assumed that ship yards have been kept busy to their utmost capacity, and that new vessels have been laid down as fast as those building have been completed.

FRANCE

VESSELS BUILDING

Name	Displacement	Speed	Armament	Builders	Remarks
Battleships					
Languedoc....	24,828	21.5	12 13.4-in., 24 5.5-in.	La Seyne	Laid down April 28, 1913
Normandie....	24,828	21.5	same	St. Nazaire	" July 5, 1913
Flandres.....	24,828	21.5	same	Brest	" Oct. 10, 1913
Gascogne.....	24,828	21.5	same	Lorient	" Oct. 1, 1913
Bearn.....	24,828	21.5	same	La Seyne	Contract Jan. 7, 1914

VESSELS BUILDING IN JULY, 1914, AND NOW COMPLETED

3 Battleships					
Bretagne class.	23,172	20	10 13.4-inch	....	Completed in 1915

NOTE.—There are approximately six destroyers and 23 submarines under construction. (Lack of information since outbreak of war has made it impossible to correct table to date.)

In July, 1914, France had building approximately 3 destroyers and 22 submarines.

Since the outbreak of war it is probable that France has increased her construction program to the extent permitted by the building facilities.

YOUNGER FLAG OFFICERS FOR FRENCH NAVY.—While sparing no effort to make up for lost time and improve the matériel of the fleet on the lines dictated by war experience, Minister Lacaze is also doing his best to add to the efficiency of the personnel, which is, of course, at the root of all other progress and a necessary condition to a rational utilization of the matériel. Hence the decision of the Minister to lower the age limit from 65 to 62 years for vice admirals, 62 to 60 for rear admirals, and 60 to 58 for captains, which would mean the retirement of 11 flag officers, including Admiral de Lapeyrère. Considerations of the same order will bring about the creation

of the rank of capitaine de corvette (lieutenant commander), which will fill a gap in the hierarchy and improve the rate of promotion among the much-dissatisfied subordinate officers—a desideratum that would long have been realized but for the continual ministerial changes.—*Naval and Military Record*, 26/1.

GERMANY

VESSELS BUILDING

Name	Displacement	Speed	Armament	Builders	Remarks
Battleships					
Ersatz Worth.	29,000	....	8 15-in., 16 5.9-in.	Kiel	Laid down Sept., 1913
"T" 1913.....	29,000	....	same	"	" May, 1913
Ersatz Friedrich III	30,000	....	8 15-in., 18 5.9-in.	....	" summer 1914
Cruisers of the Line					
Ersatz Hertha.	28,000	28.5	8 12-in.	Wilhelmshaven	Laid down July, 1913
Ersatz Victoria Louise	.....	....	....	....	" summer 1914

VESSELS BUILDING IN JULY, 1914, AND NOW COMPLETED

4 Battleships					
Grosser Kurfürst class	25,388	22	10 12-inch	....	Completed in 1914-15
2 Battle Cr's'rs					
Derfflinger class	28,000	27	8 12-inch	....	" " "
5 Light Cr'sers					
Ersatz Hela class	5,500	27.5	10 6-inch	....	" " "

NOTE.—In July, 1914, Germany had building approximately 24 destroyers and 18 submarines.

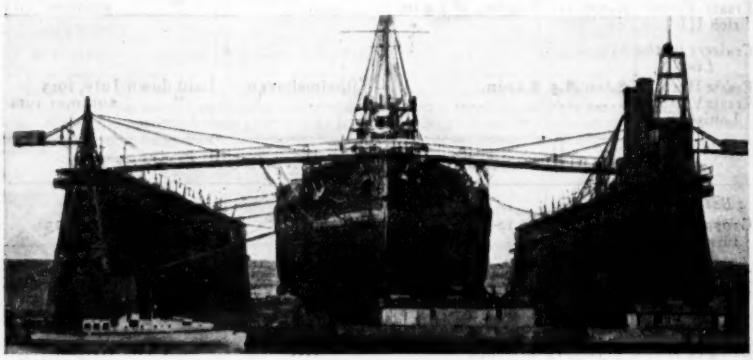
No accurate information regarding naval matters has been obtained since the outbreak of the war, but it is reported that ship construction has been pushed to the full extent of building facilities.

WARSHIP-BUILDING CAPACITY OF GERMANY.—According to that excellent naval critic Hector C. Bywater, so far as building ways and construction plants are concerned, there is no reason why Germany could not have 25 battleships or battle cruisers under construction at one and the same time. Though he admits that this figure may be astonishing, he shows that an examination of the various yards, governmental and private, in Germany, justifies the estimate. In fact, he goes further, and states that, simultaneously, a program including light cruisers, destroyers and submarines, could be put through, since there are many German yards which, although they cannot build capital ships, are well equipped to produce the lighter craft. He estimates the total working force in all these yards at 100,000 men.—*Scientific American*, 15/4.

THE GERMAN NAVY IN THE MAKING.—In an interesting article in the *United Service Magazine*, of London, for April, 1916, Mr. Hector C. Bywater, a British naval expert, deals with progress of the German Navy from 50 years ago to the present time. Mr. Bywater says:

"The German Navy, in common with almost every other, has to a great extent fashioned its ways from the British model. One has only to see a German bluejacket to recognize this. His uniform is obviously copied from that of the British tar, though the wonderful array of buttons, which seem wholly superfluous to the uninitiated, makes the costume less of a copy than a caricature, and somewhat detracts from the wearer's workmanlike appearance. German naval routine is also framed on British lines. As a rule, the men's accommodation is very good, much forethought having been expended by the designers on effective ventilation. The health average is high. Rules as to hygiene are extremely strict, and the medical service is most efficient.

"The abnormally large complements of German men-of-war have often been remarked upon. Battle cruisers, such as the *Moltke* and *Seydlitz*, have well over 1000 men on board, whereas considerably larger British ships, such as the *Lion*, carry only 950. Ships of the *Kaiser* class have a crew of 1075, compared with only 900 in the *King George V*, an equally large and more powerful ship. Germans themselves attribute the difference to their



THE ILLUSTRATION SHOWS THE GERMAN BATTLESHIP "THUERINGEN" (DISPLACEMENT 22,800 TONS) BEING OVERHAULED IN A FLOATING DOCK IN KIEL HARBOR. (By courtesy *Marine Review*, U. S. A.)

practice of providing reserve numbers for every important station on board, there being duplicate crews for every gun, etc. By this method casualties can promptly be made good, and a ship kept continually in action to her full capacity so long as the matériel escapes severe damage. Gun drill was practiced with great assiduity, and was one of the first mysteries revealed to the raw recruit. The first firing practice with shell took place 14 days after the arrival of the new batch of recruits, so that gun-shyness was speedily overcome. The allowance of practice ammunition was on a very generous scale; in the last few years it was twice as large as the corresponding British allowance.

"It is incredible that Germany's rulers should have resolved to make no use of the formidable naval weapon which for more than 20 years has been forged and sharpened with infinite pains and at colossal expense in anticipation of the very contingency that now confronts them. Common prudence warns us against any such assumption. The superhuman energy and fertility of resource which have marked German operations in the war on land are a measure of what may be impending at sea. It would be a fatal error to mistake for slumber a long silence which may veil intense and mighty preparations."—*Army and Navy Journal*, 13/5.

GREAT BRITAIN

VESSELS BUILDING

Name	Displacement	Speed	Armament	Builders	Remarks
Battleships					
1 Ship	27,500	25	8 15-inch	.....	To be completed in 1917
Renown	25,750	22	same	.....	" " "
Repulse	25,750	22	same	.....	" " "
Resistance	25,750	22	same	.....	" " "
Revenge	25,750	22	same	Vickers	" " 1916
Resolution	25,750	22	same	Palmer	" " "
Ramillies	25,750	22	same	Beardmore	" " "

VESSELS BUILDING IN JULY, 1914, AND NOW COMPLETED

Battleships					
2 Rev'nge class	25,750	22	8 15-inch	.....	Completed 1915
5 Queen Elizabeth class	27,500	25	same	.....	" 3 in '15; 2 in '14
1 Battle Cr'ser					
Tiger	30,000	30	8 13.5-inch	.....	" in 1914
Light Cruisers					
8 Cl'p'tra class	4,400	30	....	.....	" " 1914-15
6 Arethusa class	3,600	30	....	.....	" " "
3 Birmingham class	5,440	25·5	....	.....	" " 1914

NOTE.—Approximately 31 destroyers and 21 submarines were building in July, 1914. Since the war no official information regarding naval matters has been available, but it has been reported that the number of vessels building has been increased to the full capacity of the ship yards and that new vessels have been laid down as fast as those building have been completed. Also it has been reported that five large battle cruisers of 32 knots speed are nearing completion and that a number of monitors carrying 14 inch guns are either built or building.

NAVAL NEW CONSTRUCTION.—Sir C. Kinloch-Cooke (M. P.), asked on March 21 whether new construction to the utmost capacity of the yards was in progress.

Dr. Macnamara replied: "The yards have been, and are being, pressed to complete vessels building at the earliest possible dates, and to work all overtime that can be usefully spent on these vessels to achieve the above object. My honorable friend must not fall into the error of imagining that excessive overtime is calculated to secure either the highest efficiency or the greatest output."

In reply to a further question by Sir C. Kinloch-Cooke, Dr. Macnamara added that the payments for overtime in all home yards last week were in excess of the ordinary day payments by 42 per cent.—*United Service Gazette*, 30/3.

ROSYTH NAVAL BASE.—It has been notified by the Admiralty that in future the admiral with his flag flying at the Rosyth naval base will have "the status of a commander-in-chief." Hitherto he has been described as "admiral commanding the coast of Scotland."—*Army and Navy Gazette*, 8/4.

RECOGNITION FOR ENGINE-ROOM ARTIFICERS.—The great increase in the navy and the continuous sea service of every unit of the fleet have made the demands upon the engineering personnel of the fleet unprecedented in the history of the British Navy. It is true that there have been compara-

tively few actions, but in all of these the strategic and tactical advantage of speed has been an important element in the success. Moreover, overhauls, as a rule, are carried out, in peace time, in the dockyards; but during war a great part of the important work is done on board ship.

Rear Admiral Hutchinson instanced a case where the artificers on the ships of the fleets succeeded in 10 days in making good serious defects which had suddenly arisen, and which the engineer commander of the ship had told him would have taken six weeks to make good in the dockyard. This is but one of many instances which might be quoted were it prudent to do so. This strengthens the view that when opportunity arises the artificer who has distinguished himself should be promoted to commission rank.—*United Service Gazette*, 23/3.

MR. F. T. JANE.—The death at the early age of 45 of Mr. Fred T. Jane removes an interesting personality, whose long and intimate acquaintance with the navy was shown in various ways. He was perhaps best known in naval circles by his annual volume, "Fighting Ships," which had a unique position among such text-books and which he supplemented in 1910 by a volume on similar lines dealing with the world's aircraft. As the inventor of the naval war game he also did good work for the navy, and his house at Portsmouth was for a long time the center at which many young officers would foregather to play this game. Mr. Jane will certainly be missed by a wide circle, who recognized his many good qualities, his patriotism, and his whole-hearted support of a big navy.—*Army and Navy Gazette*, 18/3.

NAVAL PERSONNEL ON A WAR FOOTING.—When war broke out, there were 146,000 officers and men in service in the British Navy. In addition to these were 67,000 reserves. At the end of January, there were in active service 320,000 officers and men. Parliament had authorized the navy to work up to a maximum of 350,000 officers, men and boys by March 31, 1916. Back of these, engaged on ship construction, repairs, etc., are about 700,000 men, making a total force working for the navy, ashore and afloat, of over 1,000,000 men.—*Scientific American*, 15/4.

NAVAL RECRUITS NEEDED.—As some misapprehension has arisen with regard to the position of the naval service in relation to recruiting, the Admiralty announce that recruiting for most branches of the naval service is still open. Seamen, stokers, engine-room artificers, electrical artificers and shipwrights, besides other ratings, are required for the Royal Navy, and men with experience of internal combustion engines for the Royal Naval Air Service and Motor Boat Reserve.—*United Service Gazette*, 2/3.

NAVY AND MERCHANT SERVICE.—The twenty-third annual report of the Imperial Merchant Service Guild says the Guild has provided a body of some 2000 officers for naval duties, beginning with mine-sweeping, and including patrol service, boom defence, motor-boat patrol, salvage service, Inland Water Transport Corps (Royal Engineers), and so on. A perusal of the details given in the report as to how the various demands for trained officers was met brings home to the reader the invaluable asset possessed by the Empire in its seafaring population. But for this, even though we had a fleet superior to that of the enemy, it would certainly have been hampered, and probably strangled, in its work had not the Merchant Service Guild been able to draw upon a sufficiency of experienced seamen for mine-carriers and layers, observation ships, ammunition ships, hospital ships, oilers, store ships, water boats, colliers, meat carriers, and so forth. This enforces the lesson that a first-class naval power must of necessity possess a large and flourishing mercantile marine.—*Army and Navy Gazette*, 1/4.

NAVY AND MERCHANT SERVICE.—Sir John Jellicoe has sent a letter from the *Iron Duke* to Lieutenant T. W. Moore, R. N. R., secretary of the Imperial Merchant Service Guild, in which he says: "I am proud to have in the fleet under my command a large number of officers and men from the merchant service and am able to appreciate their arduous and loyal work most fully. The officers and men of the Royal Navy are glad to be closely associated with them, and comradeship between the fleet and His Majesty's merchant service has never been stronger than it is to-day."—*United Service Gazette*, 13/4.

SIR H. JACKSON AND MERCHANT SEAMEN.—Admiral Sir Henry Jackson, First Sea Lord, in a letter to the secretary of the Imperial Merchant Service Guild, says: "The promptitude with which the country's calls on their merchant officers and seamen has been met is invaluable. The wonderful facility with which they have learnt to carry out their duties as part of a trained fighting force is extraordinary. The Allied nations owe them a deep debt of gratitude for these responses, as well as for their indomitable pluck and endurance."—*Army and Navy Gazette*, 8/4.

CANADIAN RECRUITS FOR MOTOR-BOAT PATROL.—A new branch of recruiting is to be inaugurated in Canada. A British party has left for Canada to enlist men for the motor-boat auxiliary patrol services of the British Navy. Already several hundred expert motor men from all parts of the Dominion have offered their services in this capacity to the Dominion Naval Service Department, and these offers have been communicated to the British authorities, with the intimation that many more can be secured if recruiting is authorized for that branch of the service which has done splendid service in coping with the submarine menace.—*Shipping Illustrated*, 22/4.

NAVAL PRIZE MONEY.—The scale of distribution of naval prize money is the subject of an Order in Council published in the *London Gazette* recently, which authorizes the distribution all money decreed as prize bounty among the officers and crews of H. M. ships who are entitled to it.

It is directed that the flag officer or officers are to have one-thirtieth part of the net amount to be distributed, according to certain conditions and modifications, one of which is that no flag officer shall share in the distribution unless he was in fact on board one of H. M. ships or vessels actually present at the taking or destroying of the armed enemy ship in question. The officer or officers actually in command of H. M. ships and commanders serving as executive officers in ships commanded by captains may divide one-tenth part of the remainder, or, if there is no flag officer to share, one-tenth part of the whole amount distributable in proportions which are laid down in the Order.

After provision shall have been made for the flag share (if any), and for the commanding officer or officers and others as specified in the Order, the remainder of the net amount distributable shall be distributed in classes, so that each officer, man and boy composing the rest of the complements of H. M. ships and vessels of war, and actually present on board at such taking or destroying, and every person present and assisting shall receive shares or a share according to his class, as set forth in the following scale:

1st Class.—Captain in command—80 shares.

2d Class.—Captain not in command, and officers of equivalent rank, and commander in command or serving as executive officer in a ship commanded by a captain—40 shares.

3d Class.—Commander not in command, and officers of equivalent rank, and lieutenant commander in command, or serving as executive officer in a ship commanded by a captain—30 shares.

4th Class.—Lieutenant commander not in command, and officers of equivalent rank, and lieutenant in command, or serving as executive officer in a ship commanded by a captain—25 shares.

5th Class.—Lieutenant not in command, and officers of equivalent rank, and sub-lieutenant in command—20 shares.

6th Class.—Sub-lieutenant not in command, mate, chief warrant officer, and officers of equivalent rank—15 shares.

7th Class.—Warrant officer, R. N., and equivalent ranks, and R. M. gunner—12 shares.

8th Class.—Midshipman, clerk, chief petty officer, warrant officer of marines, staff and color sergeant of marines, and equivalent ranks and ratings—10 shares.

9th Class.—Naval cadet, assistant clerk, petty officer, petty officer 1st class (O. S.), sergeant of marines, and equivalent ranks and ratings—8 shares.

10th Class.—Petty officer 2d class (O. S.), leading seaman, corporal and bombardier of marines, and equivalent ranks and ratings—6 shares.

11th Class.—Able seaman, private gunner and bugler of marines (after training), second head krooman, second tindal, and equivalent ranks and ratings—5 shares.

12th Class.—Ordinary seamen, private gunner and bugler of marines (before completion of training), and equivalent ranks and ratings, native seamen and stokers—3 shares.

13th Class.—Supernumeraries and canteen attendants—2 shares.

14th Class.—Boys—1 share.—*The Marine Engineer and Naval Architect*, April, 1916.

PRIZE MONEY AWARDS IN COMMONWEALTH TIMES.—As our readers will be aware, prize bounty is a prize from the crown as a personal award for the sinking or capture of an armed vessel of the enemy. Commander Maxwell Anderson, R. N., who appeared on behalf of the applicants on Monday, showed that in Commonwealth times it was enacted that for all enemy ships of war burnt, sunk, or destroyed, there should be paid, for an admiral's ship £20 per gun, for a vice admiral's ship £16 per gun, and for other ships of war £10 per gun. In 1708, an alteration was made by which the award was computed on the basis of £5 for every man living on board the enemy ship or ships at the beginning of the engagement.—*Army and Navy Gazette*, 1/4.

HOLLAND

VESSELS BUILDING

Name	Displacement	Speed	Armament	Builders	Remarks
Cruisers					
.....	7000	30	10 6-in.	Amsterdam	Authorized
.....	7000	30	10 6-in.	Flushing	Authorized

NOTE.—Four submarines are building, three at Rotterdam and one at Flushing, of 836 tons displacement and a surface speed of 17½ knots.

HOLLAND'S NAVY.—There are two distinct demands which have to be met by the navy of Holland, one for coast defence at home, and the other for the protection of the colonies. For both of these purposes there are seven coast defence battleships, ranging from the *Kortenaer*, of 3520 tons, built in 1894, to the *Zeven Provincien*, of 6530 tons, built in 1909. At least three of these vessels are, or at any rate were, stationed in the Colonial waters. In May last, however, it was reported that the *Heemskerck* had been ordered home from Curaçoa, and so far as is known without replacement. As a squadron, these seven battleships should be capable of putting up a good defence, well handled as they would be by the Dutch

seamen. Their speed is from 14 to 14½ knots. Turning to the cruisers, four of these have some fighting value, two mounting 5.9-inch and 4.7-inch guns, and two 4.7-inch only, but their speed does not amount to more than 16 knots. Passing over the gunboats, of which there are several, we come to that portion of the fleet which would probably take the principal part in North Sea fighting, the torpedo flotilla. In all, this numbers about 40 boats, and has been built up with the co-operation of Messrs. Yarrow. This firm were interested in the building at Flushing in 1910-13 of a division of eight 30-knot destroyers, of 480 tons, carrying four 12-pounders. Such a division should prove of the highest value in defending the battleship squadron from submarine attack. So, too, should the torpedo-boats, of which there are about 30 built since the beginning of the century, with speeds of from 24 to 27 knots. As regards submarines, there were last spring six boats completed, and others fitting out, some of which may have since been commissioned. The first submarine dates back to 1905, and is of the *Holland* type, but the next four boats are *Whiteheads* of 150 tons' displacement. They were followed by *K-1*, of 320 to 390 tons, intended for the East Indies. Four more for foreign service, and eight 200-ton boats for home duties are building or completing. As we remarked in May last, the uses to which this little fleet might be put in case of a conflict do not open up a wide field for speculation. The small draft of many of the vessels ought, however, to be an advantage in certain respects, and in conjunction with military operations some of them should play their part on the canals if needed.—*Army and Navy Gazette*, 8/4.

ITALY

VESSELS BUILDING

Name	Displacement	Speed	Armament	Builders	Remarks
Battleships					
Carraciolo.....	30,000	25	8 15-in., 16 6-in.	....	To be completed in 1917
Marcantonio-Colonna	30,000	25	same	....	" " "
Cristofaro-Colombo	30,000	25	same	....	" " "
Francesco-Marosini	30,000	25	same	....	" " "
VESSELS BUILDING IN JULY, 1914, AND NOW COMPLETED					
Battleships					
Conte-di-Cavour	22,022	22.5	13 12-inch	....	Completed in 1914
2 Duilio class....	22,564	22.5	13 12-inch	....	" " 1915
Light Cruisers					
2 Campania class	2,500	16.5	6 6-inch	....	" " "

NOTE—In July, 1914, approximately 15 destroyers, 2 torpedo boats, and 8 submarines were building.

It is probable that the building program has been accelerated and increased since the outbreak of the war.

THE LATE ADMIRAL BETTOLO.—Giovanni Bettolo, a well-known flag officer of the Italian Navy, is reported to have died last week, according to a dispatch from Rome. In 1907 he was appointed to the direction of the General Staff of the Italian Navy and served several times as cabinet officer in the capacity of Minister of Marine. On several occasions he had command of the entire Italian fleet during grand maneuvers. He was well known to officers of foreign navies and was looked upon as a brilliant strategist and organizer.—R. I. P.—*Shipping Illustrated*, 15/4.

JAPAN

VESSELS BUILDING

Name	Displacement	Speed	Armament	Builders	Remarks
Battleships					
Yamashiro	31,300	22.5	....	Kawasaki	To be completed in 1916
Ise	31,300	22.5	....	Mitsubishi	" " " "
Hinga	31,300	22.5	....	Yokosuka	" " " 1917

VESSELS BUILDING IN JULY, 1914, AND NOW COMPLETED

1 Battleship					
Fuso	30,600	22	12 14-inch	.....	Completed in 1915
2 Battle Cr's'rs					
Haruna class	27,500	28	8 14-inch	.....	" " 1914-15

NOTE.—In July, 1914, Japan had 2 destroyers and 2 submarines under construction in England and France respectively.

PORTUGAL

EFFECTIVE VESSELS IN PORTUGAL'S NAVY

Name	Displacement	Speed	Armament	Complement	Remarks
Battleships					
Vasco Da Gama	3,000	15	2 8-inch, 4 4.7-inch	220	Completed in 1877; refitted in 1903.
Cruisers					
Republica	1,640	17.5	4 5.9-in., 2 3.9-in.	273	Completed in 1901.
Sao Gabriel	1,772	17	2 5.9-in., 4 4.7-in.	242	Completed in 1899.
AlnurariteReis	4,100	22	4 5.9-in., 8 4.7-in.	473	Completed in 1899.
Adamaster	1,962	18	2 5.9-in., 4 4.7-in.	232	Completed in 1897.

NOTE.—In addition to the above Portugal has 5 gunboats, 6 destroyers, 3 torpedo boats, and 1 submarine. (2 gunboats, 2 destroyers, and 3 submarines are in process of construction.)

RUSSIA

VESSELS BUILDING

Name	Displacement	Speed	Armament	Builders	Remarks
Battleships					
Emperor Alexander III	22,435	21	12 12-in., 20 4.7-in.	Nikolaieff	Commissioned 1915
Empress Marie	22,435	21	same	Ivan Bunge Co	" 1914
Catherine II...	22,435	21	same	" " "	" 1915
Battle Cruisers					
Ismail.....	32,200	25	12 14-in., 21 5.1-in.	Galerni	To be completed in 1916
Kinburn.....	32,200	25	same	Baltic Works	" " "
Borodino.....	32,200	25	same	Galerni	" " "
Navarin.....	32,200	25	same	Baltic Works	" " "

VESSELS BUILDING IN JULY, 1914, AND NOW COMPLETED

Battleships					
4 Sevastopol[1] class	23,026	23	12 12-inch	....	Completed in 1914
Light Cruisers					
6 Adm'l Greig class	7,500	32	....	....	" " 1914-15
2 Ad. Nevelskoi class	4,500	..	....	....	" " "

NOTE.—Approximately 44 destroyers and 19 submarines were building in July, 1914. Official information regarding naval matters being unobtainable since the outbreak of war, it may be assumed that the ship yards have been kept busy to their utmost capacity and new vessels have been laid as fast as those building have been completed.

Russian shipbuilding at present is chiefly confined to government work. In the large naval construction yards, the equipment is equal to that of any first-class British or American yards, and the technical staff and the supply of skilled workmen are becoming more numerous and experienced. The wages of skilled labor are moderate, but the costs of the technical staff and administration are considerable. With the exceedingly high construction bounties for Russian-built hulls and engines, it should be possible for Russian shipbuilding works to compete with foreign builders after the war, especially for superior types of vessels of any size. The Russian construction bounties came into force Jan. 1, 1913, and continue until Jan. 1, 1928, when they are open to change. It is not to be anticipated, judging from the present benevolent attitude of the government towards all shipbuilding enterprise, that even when the present law expires any legislation will take place which would endanger the existence of shipbuilding works. Everything points to increasing efforts on the part of Russia to further the development of Russian shipbuilding and maritime enterprise generally. There will be an increasing amount of tonnage of the smaller dimensions employed on the large internal waterways, and the amount of repair work is considerable.—*Shipping Illustrated*, 8/4.

ONE HUNDRED NEW RUSSIAN SUBMARINES.—The Submarine Boat Corporation, which controls the Holland patents, is reported to have received a contract from Russia to furnish designs and supervise the construction in Russia of 100 45-foot submarines to be carried on the decks of battleships or of mother-ships, in addition to 50 large submarines. The vessels will cost $200,000 and $600,000 each, respectively. The contract is said to provide for the building of the boats on a commission and royalty basis of from 6 to 8 per cent.—*Shipping Illustrated*, 11/3.

JAPANESE SHIPS FOR RUSSIA.—There is a kind of sentimental interest about the decision of the Japanese Government to retrocede to Russia three warships taken during the campaign in the Far East. It is, indeed, a gracious act on the part of Japan, and significant of the unity between these two Allies, who only 12 years ago were at war. Naval men, however, will be more interested in the uses to which the ships may be put after their transfer. The *Sagami* and *Tango*, launched in 1898 and 1894 respectively, are similar in type to the British *Majestic* class. The *Soya*, launched in 1899, at Philadelphia, is a well-armed protected cruiser of good speed. It has been suggested that the transfer of these ships means that Russia has been provided with a coast defence squadron for the Far East, based on Vladivostok. As an entry port for a large and valuable trade, this place might be an attraction for a raider like the *Möwe*. If the three vessels should go to Vladivostok the two battleships should make efficient guardships, while the cruiser has both the speed and gun-power which should prove efficient to dispose of any would-be raider in those parts. In any case, Japan has set an example to all the Allies of that spirit of helpfulness and co-operation which will go far to win the war.—*Army and Navy Gazette*, 15/4.

THE RUSSIAN FLEET.—The interview with Admiral Kanin, the Russian fleet's commander-in-chief, granted to a correspondent of the *Novoe Vremya*, shows how the safety of Petrograd depends to no small extent on the ability of the fleet to prevent a landing of the enemy on the shores of the Gulf of Riga. The fundamental strategic picture, as the Admiral pointed out, is amply clear. The Baltic fleet is a continuation of the extreme flank of the army; the task of the fleet is as far as possible to support the movements of the army, protecting it against envelopment by the German fleet. The commander-in-chief remarked how extraordinarily the Russian seamen had been helped by the English submarines, and paid a high tribute to the wonderful bearing and coolness of the officers as well as to the efficiency of the boats. Another officer in the flagship told the interviewer that the Russian fleet to-day is not what it was 12 years ago. The experience of the war in the Far East has told; and moreover, the work of the late Admiral Essen is remembered with the greatest gratitude. He worked wonders with the navy, and taught the fleet to navigate the entire Baltic, not excluding the most perilous parts.—*Army and Navy Gazette*, 8/4.

NEW RUSSIAN HARBORS.—The railroad from Petrograd to the new port of Soroka, on the White Sea, is now open for traffic, and as soon as the ice moves outward vessels may steam past Archangel direct for Soroka and unload at the latter port. The new Soroka-Petrograd line is broad gauge throughout. It is made up of three sections, the first comprising the Northern Railroad, the main line of which runs east from Petrograd 73 miles; the second section, comprising the Olonets private owned line, which extends from Zvanka, on the northern main line, to Petrozavodsk, a distance of 176 miles, and the third section made up of the recently built road running north from Petrozavodsk to Soroka. This last stretch measures 237 miles. It is proposed this season to utilize the Archangel road wholly for government supplies and divert to Soroka all commercial shipments on the part of private enterprise. In this way it is hoped to relieve speedily any congestion which may occur at Archangel. At the present time more than 100 steamships are reported as being frozen in the ice near Archangel. These vessels have been imprisoned throughout the winter. In some instances the demurrage charges have been so great that the charterers have been forced to buy the vessels outright. The road from Soroka is planned to continue on to Kandalaksha, but this stretch is still under construction. It is proposed to move cargoes which have come in

by Kola and thence over the completed Kola-Kandalaksha Railroad to Kandalaksha to Soroka by water.

The new port of Nikolaievska, at the mouth of the Amur River, is now in shape to handle about 36,000 tons with the facilities at hand. Freight is now forwarded up the Amur River to Stretyinsk, which point is reached by a roalroad line connecting with the Trans-Siberian Railway.—*Shipping Illustrated*, 29/4.

SPAIN

VESSELS BUILDING

Name	Displacement	Speed	Armament	Builders	Remarks
Battleships					
Alfonso XIII..	15,450	19.5	8 12-in., 20 4-in.	Ferrol	Launched May 7, 1913
Jaime I.....	15,450	19.5	same	"	Laid down Feb. 5, 1912

NOTE.—Spain's building program includes the following: 4 fast cruisers, 6 destroyers, 28 submarines, 3 gunboats, and 18 coast-guard mine layers.

UNITED STATES

"PORTER'S" TRIALS.—The new torpedo-boat destroyer *Porter* made a high-speed run at the rate of 30.77 knots, more than a full knot in excess of contract requirements, on her standardization trials off the Maine coast on March 11. In addition, it was said by those on board that she had come well within contract requirements in her fuel consumption tests. The *Porter* was required to make 29½ knots. Her fastest mile was not only well above this, but the average of her five top-speed runs was 30.04 knots, and in her full-power endurance test for four hours she averaged 29.59 knots.—*Army and Navy Journal*, 18/3.

DESTROYER "SAMPSON."—The U. S. destroyer *Sampson* was launched at Quincy, Mass., March 4. She is 315 feet long, 29.10 feet beam and 18.9 feet deep. She will be driven by Curtis turbines and oil-fired Yarrow boilers. Unlike her predecessors, she will have only two funnels and her guns will be mounted on the forecastle.—*Shipping Illustrated*, 11/3.

BLUEJACKETS TO REPAIR SHIPS

BOSTON, April 21.

Seven thousand bluejackets at the Charleston Navy Yard were put in overalls to make the 30 war vessels in the harbor ready for sea at the earliest possible hour. It was authoritatively stated that virtually every ship would be at the top-notch of efficiency in 15 days. The enlisted men are being employed because of the difficulty in obtaining sufficient civilian mechanics. Half of the 7000 had been recalled from furloughs and shore leaves. The vessels to be overhauled include six battleships with a total of about 5000 officers and men; ten torpedo-boat destroyers, three scout cruisers, one submarine, and several auxiliary ships.—*Nautical Gazette*, 27/4.

PROVIDING FOR NAVY VESSELS.—That the private and government ship yards of the United States are now in a position to "take care of as large a building program as Congress is willing to authorize" is the opinion of Chief Constructor David W. Taylor, Chief of the Bureau of Construction and Repair, U. S. N. "So far as the physical existence of slips goes," says Admiral Taylor, "there should be no trouble encountered in placing contracts for the proposed number of large vessels. There are, however, two

NAVY DEPARTMENT
BUREAU OF CONSTRUCTION AND REPAIR
VESSELS UNDER CONSTRUCTION, UNITED STATES NAVY, MAY 10, 1916

Name, type and no. of vessel	Contractor	Per cent of completion			
		May 1, 1916		Apr. 1, 1916	
		Total	% on ship	Total	% on ship
Battleships					
37 Oklahoma	New York S. B. Co.	Del'v'd	5-2-16	99.8	99.8
38 Pennsylvania	Newport News S. B. Co.	99.3	99.3	98.8	98.8
39 Arizona	New York Navy Yard	89.9	89.2	87.6	86.7
40 New Mexico	New York Navy Yard	26.1	19.5	24.0	17.7
41 Mississippi	Newport News S. B. Co.	43.9	32.9	41.5	29.8
42 Idaho	New York S. B. Co.	59.1	55.3	57.5	53.6
43 Tennessee	New York Navy Yard	0.0	.....	.....	.....
44 California	Mare Island Navy Yard	0.0	.....	.....	.....
Destroyers					
57 Tucker	Fore River S. B. Corporation	Del'v'd	4-11-16	97.0	97.0
59 Porter	Wm. Cramp & Sons	Del'v'd	4 17-16	94.9	94.8
62 Wainwright	New York S. B. Co.	99.9	99.9	99.5	99.5
63 Sampson	Fore River S. B. Corporation	87.7	87.1	82.6	81.6
64 Rowan	Fore River S. B. Corporation	82.1	81.2	78.4	76.9
65 Davis	Bath Iron Works	79.6	78.8	76.5	75.3
66 Allen	Bath Iron Works	77.0	75.9	74.2	72.6
67 Wilkes	Wm. Cramp & Sons	63.4	61.7	58.9	56.7
68 Shaw	Mare Island Navy Yard	33.6	31.4	28.2	25.1
69	Mare Island Navy Yard	0.0	.....	.....	.....
70	Norfolk Navy Yard	0.0	.....	.....	.....
71	Seattle Construction & D. D. Co.	0.0	.....	.....	.....
72	Wm. Cramp & Sons	0.0	.....	.....	.....
73	Wm. Cramp & Sons	0.0	.....	.....	.....
74	Bath Iron Works	9.1	2.7	4.1	2.0
Submarines					
27 G-2[1]	Lake T. B. Co. (Bridgeport)	92.0	92.0	92.0	92.0
31 G-3[1]	Lake T. B. Co. (Bridgeport)	89.5	89.3	89.5	89.3
40 L-1	Electric Boat Co. (Quincy)	Del'v'd	4-11-16	99.7	99.7
41 L-2	Electric Boat Co. (Quincy)	99.1	99.1	98.9	98.9
42 L-3	Electric Boat Co. (Quincy)	Del'v'd	4-21-16	98.9	98.9
43 L-4	Electric Boat Co. (Quincy)	Del'v'd	5-2-16	98.9	98.9
44 L-5	Lake T. B. Co. (Bridgeport)	86.1	84.9	85.6	83.4
45 L-6	Lake T. B. Co. (Long Beach, Cal.)	82.4	79.5	81.1	78.4
46 L-7	Lake T. B. Co. (Long Beach, Cal.)	81.2	78.3	79.0	76.3
47 M-1	Electric Boat Co. (Quincy)	96.0	96.0	96.0	96.0
48 L-8	Portsmouth, N. H., Navy Yard	85.7	83.7	79.7	76.2
49 L-9	Electric Boat Co. (Quincy)	94.2	94.2	93.3	93.3
50 L-10	Electric Boat Co. (Quincy)	92.7	92.7	92.4	91.8
51 L-11	Electric Boat Co. (Quincy)	90.4	90.1	88.5	86.6
52 Schley	Electric Boat Co. (Quincy)	12.4	5.3	3.8	2.7
53 N-1	Electric Boat Co. (Seattle)	56.1	46.2	54.7	45.5
54 N-2	Electric Boat Co. (Seattle)	56.1	46.2	54.7	45.5
55 N-3	Electric Boat Co. (Seattle)	56.1	46.2	54.7	45.5
56 N-4	Lake T. B. Co. (Bridgeport)	64.2	58.7	62.4	56.4
57 N-5	Lake T. B. Co. (Bridgeport)	63.2	57.6	61.4	55.4
58 N-6	Lake T. B. Co. (Bridgeport)	61.4	55.7	60.2	54.0
59 N-7	Lake T. B. Co. (Bridgeport)	61.5	55.4	57.5	52.9
62 O-1	Portsmouth, N. H., Navy Yard	0.0	.....	.....	.....
63 O-2	Puget Sound Navy Yard	0.0	.....	.....	.....
64 O-3	Electric Boat Co. (Quincy)	0.0	.....	.....	.....
65 O-4	Electric Boat Co. (Quincy)	0.0	.....	.....	.....
66 O-5	Electric Boat Co. (Quincy)	0.0	.....	.....	.....
67 O-6	Electric Boat Co. (Quincy)	0.0	.....	.....	.....
68 O-7	Electric Boat Co. (Quincy)	0.0	.....	.....	.....
69 O-8	Electric Boat Co. (Quincy)	0.0	.....	.....	.....
70 O-9	Electric Boat Co. (Quincy)	0.0	.....	.....	.....
71 O-10	Electric Boat Co. (Quincy)	0.0	.....	.....	.....
72 O-11	Lake Tor. Boat Co. (Bridgeport)	11.2	5.9	7.1	5.1
73 O-12	Lake Tor. Boat Co. (Bridgeport)	10.9	5.8	7.1	5.0
74 O-13	Lake Tor. Boat Co. (Bridgeport)	9.9	5.8	6.8	5.0
75 O-14	Cal. S. B. Co. (Long Beach, Cal.)	7.5	5.0	5.1	3.7
76 O-15	Cal. S. B. Co. (Long Beach, Cal.)	7.0	5.0	5.0	3.6
77 O-16	Cal. S. B. Co. (Long Beach, Cal.)	6.8	4.9	4.9	3.5
Fuel Ships					
14 Maumee[2]	Mare Island Navy Yard	99.7	99.7	99.7	99.7
15 Cuyama	Mare Island Navy Yard	50.3	46.0	43.4	36.7
Miscellaneous					
Bridge (Supply Ship No. 1).	Boston Navy Yard	60.3	58.2	53.0	51.7
Henderson (Transport No. 1.)	Phila. Navy Yard	58.9	56.7	54.0	51.0

[1] Contracts forfeited, vessels being completed New York Yard.
[2] Vessel now at Navy Yard New York for installation of engines.

possible sources of difficulty which might lead to ultimate delay, depending on the continuance or otherwise of the present heavy demand for new merchant tonnage. First, is a possible shortage of skilled workmen which would lead to building periods longer than the normal, unless the merchant work is put aside. Second, if private shipbuilders continue to be able to obtain merchant contracts at highly remunerative figures and in sufficient volume to absorb to their normal productive capacity, they might be unwilling to take new naval works unless an equivalent profit were assured and contracts made at the prevailing market value of their building capacity. The estimates for new construction are of necessity based on conditions at the date of such estimates and are believed to be sufficient to enable the vessels in question to be contracted for with normal construction periods. They should, however, by no means be reduced."

It is insisted by Admiral Taylor that part of the government's work should be let to private yards. In order to be equipped to build battleships private yards must maintain a special organization and a highly trained personnel, which is a real asset to the government. No special equipment or organization is required for the smaller ships of the navy, but it is absolutely necessary for the building of battleships and battle cruisers. With this special equipment a private yard is virtually a government section, and without it the navy would be compelled to depend entirely upon the government yards.

In this connection one of the marked signs of the difference in the viewpoint of Congress towards naval affairs has been shown in the matter of a recent emergency appropriation granting the Navy Department authority to increase its drafting force, the insufficiency of which has crippled the Bureau of Construction and Repair for more than 10 years and has materially hindered or delayed the construction of ships. As a result of this appropriation within the last few weeks 140 expert draftsmen have been added to the navy rolls. Heretofore the Navy Department has never completed plans for new ships until they were actually authorized by Congress. Work already under construction and repair work usually jammed the drafting rooms so that it was impossible to take on more with the small forces available. As a result of this system a year or more has elapsed at times before ships actually authorized were contracted for. This meant that the entire program has usually been many months, if not a year, behind the schedule. Under the new system this evil appears to be disappearing rapidly. In fact, plans for at least two of the ships proposed in the five-year program are already complete. This is a record for the navy. It means that the Department will be in a position to ask for bids on the new ships just as soon as President Wilson affixes his signature to the new law authorizing the five-year program.—*Army and Navy Journal*, 29/4.

SHIPBUILDING IN UNITED STATES.—The shipbuilding boom in the United States continues with unabated vitality, and every effort is being made to cope with the unprecedented demand upon the shipbuilding facilities at present existing, while a number of firms are rapidly pushing forward with the laying down of new plant. Several yards are reported to be so full of work that they are refusing new orders with the exception of those for types of vessels of which building plans at present exist or which will be duplicates of ships already constructed. The delay in the delivery of materials and auxiliaries, in addition to the shortage of skilled labor, continues to prevent any extraordinary speeding up, but the utmost is being made of every kind of labor-saving machinery available.

An important step has been taken by the Newport News Shipbuilding Company, Newport News, Va., and the New York Shipbuilding Company, Camden, N. J., who have obtained permission to construct, under license, motor engines of the "Werkspoor" design. These two American concerns are the first to take up the construction of a slow-speed Diesel engine of a type suitable for large ocean-going ships.

Among the more important shipbuilding yards that have changed hands in the United States recently is that of the United Engineering Works,

Alameda, which, it is reported, has been purchased for over a million dollars by the Union Iron Works Company, San Francisco. The new owners contemplate considerable renovation and additions to the existing plant, and three new berths will be laid out. A new shipbuilding company has also been formed in Philadelphia, Pa., to be known as the Pennsylvania Shipbuilding Company, with the object of constructing steam freighters for transatlantic service.—*The Shipbuilder.*

CAUSE OF DELAY IN STARTING WORK ON BATTLESHIPS NOS. 43 AND 44.—The Navy Department has been informed that private shipbuilders will be able to take care of the two battleships, two battle cruisers and three scout ships which the administration is recommending. According to a statement made by Secretary Daniels, the report that none of the private shipbuilding yards is in a position to undertake warship construction for a year is an error. The delay in starting work on battleships Nos. 43 and 44, authorized by the last Congress, which will be built at the New York and Mare Island yards, has been due to the necessity of conducting experiments to make the hulls torpedo proof. But the delay in the construction of these vessels will not be as real as some persons imagine. Before awarding contracts the Navy Department got in touch with the steel makers and placed orders for the needed material. This steel is now being manufactured. The government bought it at an average price of 1⅝ cents a pound. Now, the Pittsburgh quotations for this kind of steel are 3½ cents a pound. If these contracts were now let it would cost the government about $1,500,000 more. While the battleship to be built at the New York yard cannot be laid down until next fall, because the *New Mexico,* now on the ways will not be launched until summer, this ship could not have been laid down earlier at the yard of the Newport News Shipbuilding Co., the lowest bidder, because the next available building slip at this yard is now occupied by the *Mississippi,* which is not due for launching until fall. No bid was received from private shipbuilders for either of these vessels within the limit of cost fixed by Congress, and under the law it was absolutely necessary for them to be awarded to the lowest bidders. The employment of additional draftsmen in certain navy yards and in the Bureaus of Construction and Repair and of Steam Engineering has served to expedite the preparation of plans and specifications for the new ships contemplated in the administration's five-year building program, and will enable the Department to issue invitations for bids for these vessels more promptly than had been possible heretofore.—*Shipping Illustrated,* 15/4.

U. S. SHIPBUILDING FACILITIES.—Seeking to ascertain the shipbuilding facilities of private yards throughout the country, Chairman Padgett of the House Committee on Naval Affairs, has written letters to all shipbuilding concerns. The replies will have an important bearing on the Naval Appropriation bill. If the replies are not satisfactory the Naval Committee it is understood, will authorize liberal appropriations for improvements of the several government navy yards. The committee chairman asked the companies to assume that battleships are to be between 600 and 650 feet in length, battle cruisers between 800 and 900 feet, scouts 550 feet and destroyers 315 feet. He then asks these questions:

Considering the state of the material and labor markets, how many ships can you lay down in six months?

Putting aside all your private contracts, how many vessels can you lay down within that time?

How and in what respect can you enlarge your present facilities?

State the maximum number of vessels of a single type you can lay down in six months—in other words, taking any one of the classes mentioned above.

Give the same information on the basis of enlarging your plant to the fullest capacity.

Having consideration for your private contracts how soon can you lay down any of the type of vessels named above?

Give any other information of value to the committee.

Another letter has been sent to all concerns capable of constructing submarines. Chairman Padgett asked these companies to give him full information concerning their ability to turn out submarines of the "O," "H," and "U" types, including the cost per ton, and the shortest possible time of delivery, taking all elements of production into consideration. He also asks the annual capacity of the yards for building submarines of the "O" and "H" types, and he calls for suggestions for facilitating the building of submarines, and particularly the 800-ton vessels of the "U" type. Unless there is prospect for a "speeding up" in construction under contract, the committee, it is understood, will go more thoroughly into the policy of equipping all U. S. Navy Yards with facilities for turning out any type of vessel in a limited time.—*Shipping Illustrated, 25/3.*

NAVAL COMMITTEE BUILDING PROGRAM.—At the conclusion of the session of the House Committee on Naval Affairs on May 18 the following announcement of the agreement on the building program for the navy was given out:

"For the purpose of further increasing the naval establishment of the United States the President of the United States is hereby authorized to have constructed five battle cruisers carrying suitable armor and as powerful armament as any other vessel of their class, to have the highest practicable speed and greatest desirable radius of action, to cost, exclusive of armor and armament, not to exceed $15,000,000 each.

"Four scout cruisers, carrying suitable protection and armament suited to their size and type, to have the highest practicable speed and greatest desirable radius of action, to cost, exclusive of armor and armament, not to exceed $4,500,000 each.

"Ten torpedo-boat destroyers to have the highest practicable speed and greatest desirable radius of action, to cost, exclusive of armor and armament, not to exceed $1,000,000 each.

"Twenty submarines, of which number three shall be of a surface displacement of about 800 tons each, to cost, exclusive of armor and armament, not to exceed $1,200,000 each, and the remaining 17 submarines shall be the best and most desirable and useful type of a submarine which can be procured at a cost, exclusive of armor and armament, not to exceed $625,000 each.

"One hospital ship to cost, not to exceed $2,250,000.

"One fuel oil ship to cost, exclusive of armor and armament, not to exceed $1,265,000

"One ammunition ship to cost, exclusive of armor and armament, not to exceed $2,600,000."

The figures given in the following table are approximated from the figures given out by the House Committee on Naval Affairs and the estimate of the Navy Department previously issued:

DETAILS OF INCREASE OF THE NAVY ESTIMATES

Ship	Hull	Machinery	Armor and armament	Total cost one ship	No. of ships	Total cost
Battle cruisers	$7,000,000	$8,000,000	$5,433,531	$20,433,531	5	$102,166,665
Scout cruisers	2,000,000	2,500,000	1,071,900	5,571,900	4	22,287,600
Torpedoboat destroyers	400,000	600,000	325,314	1,325,314	10	13,253,140
Fleet submarines	.....	.....	.....	1,200,000	3	3,600,000
Coast submarines	.....	.....	.....	625,000	17	10,625,000
Hospital ship	1,750,000	500,000	.....	2,250,000	1	2,250,000
Fuel oil ship	.....	.....	.....	1,265,000	1	1,265,000
Ammunition ship	.....	.....	.....	2,600,000	1	2,600,000

The five battle cruisers were the result of the compromise between the small and large navy Democrats. There will be a bitter contest both on the floor of the House and in the Senate over a proposition to include two battleships in the program. The prediction is being made that the final outcome will be at least four battle cruisers and two battleships. It is possible that the five battle cruisers will be kept in the program in addition to two battleships.

In addition to voting on the appropriation the members of the House voted unanimously to include in the naval bill a resolution offered by Representative Hensley, of Missouri, authorizing the President, after the war in Europe ends, to invite all the great governments of the world to a conference for establishing somebody that will act as a court of arbitration in international affairs and consider the question of disarmament. The resolution empowers the President to appoint nine citizens of the United States of "eminence in the law" to act as its representatives in such conference and provides $200,000 for carrying out the purposes of the resolution.

Secretary Daniels said of the action of the House: "Of course, I think it would have been best if the House Committee had reported the five-year program, but I understand that at no time was it possible to secure the votes of a majority of the committee for this larger proposition. A very considerable number of the naval officers who testified before the committee showed that they favored building battle cruisers instead of battleships for a time owing to the pressing need of this type of ship, which represents the highest type of warship design. The opinion of the General Board, however, in which I concur, was that it was probably wiser to divide our new construction of capital ships this year between dreadnoughts and battle cruisers. However, the need for these swift, huge, heavily-gunned ships is so pressing when we consider the other great navies of the world that I had far rather see the number I suggested increased than diminished. As I said at the time, the program I presented to Congress represented a minimum and not a maximum of each type. I am sorry that the battleships were eliminated, and I would be gratified if they were restored before the bill came to the President. One thing about the committee's report is extremely gratifying, and that is that members of the committee who voted for only one battleship last year this year voted for five battle cruisers."

Items in the naval budget relating to appropriations for aeronautics, drydocks, ammunition for ships already authorized or built and reserve ammunition are provided for in the House bill. The increase in the personnel of the navy by 13,500 men, remains in the budget and 3000 for the Marine Corps. The new battle cruisers are expected to have a speed of 35 knots.—*Army and Navy Journal*, 20/5.

HOW TO PUT U. S. NAVY IN SECOND PLACE.—The General Board of the Navy reported to the House Committee on Naval Affairs to-day that the United States Navy will require, to get back into second place among the navies of the world, a construction program for three years involving the building of more vessels than the administration proposes to build in five years. Congress is informed that if it desires to put the navy in second place it must expend $604,012,179 in the next three years for new vessels as against $500,000,000 that the administration proposes to spend in the coming five years. This information was supplied to the committee at the request of the Republican members who want to see the navy in second place.

The total cost of restoring the navy to second place, according to the board, will be $791,441,207. This total includes, in addition to the cost of the new vessels, the cost for a year of the increased personnel that

would be necessary and the cost for a year of the additional ammunition and other supplies that would be required.

This is the way the board sizes up the situation:

	Germany	United States	No. Needed by United States	Cost
Dreadnoughts	22	17	6	$103,280,586
Pre-dreadnoughts	20	32	0	.....
Coast defence vessels	0	4	0	.....
Battle cruisers	9	0	10	204,335,310
Armored cruisers	3	10	0	.....
Cruiser scouts	34	14	21	117,009,900
Destroyers	145	70	80	106,025,120
Torpedo-boats	0	2	0	.....
Submarines:—				
Fleet	(?)	3	9	15,169,707
Coast	(?)	72	78	51,191,556
Air craft	—	—	—	7,000,000
				$604,012,179

GENERAL BOARD ON RELATIVE STRENGTH OF U. S. NAVY.—Mr. Daniels, Secretary of the Navy, to-day made public a report of the General Board of the navy, written in response to questions recently submitted to the Navy Department by Representative Thomas S. Butler, of Pennsylvania, to determine how the United States could restore its navy to second place within three years.

Recounting the fall of the American Navy to third place and its ups and downs in relative power, the General Board's reply says:

"There is no known method of measuring, accurately, the relative power of two navies, as all elements must be considered, such as displacement, number and size of guns, muzzle energy of battery, thickness and distribution of armor, speed and endurance. Displacement is a simple and convenient measure. Using displacement as the comparative measure of material, and active personnel as the comparative measure of personnel, the following shows when the United States became second in size and strength and when the United States lost second position:

"(a) Considering displacement of 'ships built,' the United States advanced from third to second place in 1907, and dropped to third place in 1911.

"(b) Considering displacement of ships built and building, the United States advanced from third to second place in 1909, held this place for a short time only, and dropped to third place again in the same year, 1909.

Sixth Place in Personnel.—"(c) Considering 'active personnel,' the United States advanced from third to second place in 1908, dropped to third place in 1911 and to fourth place in 1913. The United States advanced again to third place in the first part of 1914 and later that year dropped to sixth place, owing to the expansion of the naval personnel of belligerent nations.

"The United States lost second position in naval strength because it did not build ships and provide personnel to meet the well-known building program of the nation now second in naval strength. The German laws of 1898 and 1900 with amendments of 1906 and 1912 laid down a definite program of building ships, providing the necessary personnel and for replacing battleships after twenty years in service."

Upon the matter of regaining this lost ground the board's report states:

"The General Board, without extended investigation, is unable to state the maximum number of ships that could be built within three years. The number does not depend alone upon the number of building ships available, but also upon the amount of skilled labor available, the supply of hull and machinery material and the maximum output of armor and gun plants.

Cost of Speeding Up.—"Should Congress pass a law requiring shipbuilding firms to disregard all private contracts and requiring all manufacturers of material to do the same, the number of ships that could be built could be greatly increased. The time required to build ships could be shortened if the limitations of the eight hours labor laws were removed and also if the government were willing to pay the additional cost of having the ships built by labor working in shifts; this again would depend upon the amount of skilled labor available and the capabilities of the manufacturers of armor, guns and material to make deliveries.

"The General Board is not able to estimate the cost of ships built by men working in shifts. A reliable shipbuilding firm has stated that reducing the time of building a certain class of ships by one-half increases the cost 40 per cent, and it is reasonable to assume that the increased cost for all classes of ships would be approximately the same.

"The letters from shipbuilding firms indicate there are available building slips to lay down within six months after contracts are awarded the following ships: Five battleships, five battle cruisers, nine scouts, twenty-two destroyers and unlimited submarines.

"A capital ship can be completed in 32 to 38 months after signing the contract, others in much less time. Capital ships can be launched in a year after the laying down of the keel and the slips thus become available for building other ships. The authorization at one time of a large number of ships will encourage builders and manufacturers to increase their facilities. "GEORGE DEWEY."—*N. Y. Herald*, 4/5.

NAVAL RESERVES.—A naval reserve force is provided for by the Naval Appropriation Bill as agreed to by the Committee on Naval Affairs. The reserve is divided into three classes, to be known as fleet naval reserves, naval reserves and naval auxiliary reserves, with a rate of pay which it is believed will secure a sufficient force of reserves to fill up both the active and reserve fleets of the navy in the event of war. There is also a provision for manning auxiliaries and a requirement by which officers and men on merchant marine ships may be enlisted as naval reserves. The fleet naval reserves will consist of honorably discharged officers and men of the regular navy. Enlisted men who have served less than eight years in the navy will be entitled to an annual allowance of $30 while they are in the reserve; those who have served between 8 and 12 years, $60 a year, and those who have 12 years' service in the navy to their credit will have an annual allowance of $100. The naval reserves will consist of those men between the ages of 18 and 35 years who are engaged in a seagoing profession. They are required to serve three months in the navy, after which the enlisted men upon passing into the reserves will receive annually two months' pay of their rating and grade. Naval auxiliary reserves are those in the seagoing profession who serve on vessels listed as naval auxiliaries and agree to serve on such vessels in the event of war. The crews of merchant marine ships will be included in this class. They draw two months' pay in their rate and grade while they are in the reserve. There is to be also a naval coast defence reserve, to consist of the owners and masters of yachts and motor-boats who are listed by the Navy Department. The owners of such craft agree in the event of war to turn their boats over to the navy at an agreed price.—*Army and Navy Journal*, 13/5.

PERSONNEL OF OUR MERCHANT MARINE.—The Bureau of Navigation of the Department of Commerce has issued a statement which shows that on

June 30 last the 26,701 documented merchant vessels of the United States were manned by 152,133 officers and men, exclusive of masters. In addition to this, 1556 American yachts were manned by 7531 men, excluding masters. The total tonnage of these vessels was 8,487,331 gross tons. This tonnage was divided into 2587 seagoing, 2568 lake vessels and 21,546 craft of other descriptions so far as the merchant vessels are concerned. The seagoing yachts numbered 694, those on the lakes 231, and the remainder 630. For comparison with the above, the merchant ships of Great Britain in 1913, aggregating 19,100,000 gross tons, and excluding British colonies, were manned by 292,057 officers and men, including masters. In 1913 the German merchant fleet also was constituted as follows: Aggregate gross tons 5,428,175, manned by 91,169 masters, officers and men.—*Marine Journal*, 1/4.

TO CREATE A NAVAL RESERVE.—H. R. 13002, Mr. Miller, of Minnesota.—That in addition to the naval forces of the U. S. already existing there is hereby created and established a naval force to be known as the U. S. Naval Reserve.

The U. S. Naval Reserve shall consist of 15,000 men, between the ages of 18 and 35 years, who shall enlist to serve during a period of three years under regulations for drill and discipline to be prescribed by the Secretary of the Navy.

The Secretary of the Navy is authorized to establish at convenient places in the U. S. one or more battalions of the U. S. Naval Reserve, each battalion to consist of at least four divisions and not more than eight, and each division shall consist of not more than 100 men and not less than 40.

To the command of each battalion the Secretary of the Navy shall assign an officer of the U. S. Navy of suitable rank; and in addition to the enlisted men herein provided the Secretary of the Navy shall appoint the following civilian officers for each battalion, namely, one battalion commander, rank of commander; one each executive officer, navigating officer, ordnance officer, engineer officer, surgeon and paymaster, each with rank of lieutenant commander; one signal officer, rank of lieutenant (junior grade); one assistant surgeon; one aid, rank of ensign; and one assistant paymaster; also the following division officers: One lieutenant, one lieutenant (junior grade), and one ensign for each division of the battalion.

Chief petty officers and petty officers shall be appointed in conformity with rules and regulations governing the navy.

The officers of each battalion shall receive commissions from the Secretary of the Navy upon passing examination, commissions to be at all times subject to revocation upon recommendation of a court of inquiry. Officers of the naval militia of the several states at the time of the passage of this act shall be first entitled to appointment, upon examination.

The battalion officers shall be appointed by the Secretary of the Navy and hold commissions during good behavior, and promotions shall be made in conformity with regulations of the navy.

The Secretary of the Navy is authorized to station at each port of the U. S. where the headquarters of a battalion of U. S. Naval Reserves are established, one or more vessels of the navy, as may be required, for the use of such naval reserve, and may detail an officer and such enlisted men from the navy as may be required to care for and render efficient at all times the vessel or vessels so stationed; and such enlisted men so detailed shall be in addition to the number of men constituting the regular naval service.

The Secretary of the Navy is directed to provide naval reserve battalions with uniforms and clothing for enlisted men, arms, guns, equipment, supplies and ammunition for drills and service.

An examination board of not less than three officers of the navy shall pass upon the qualifications of candidates for commissions in the naval reserve.

Regular and periodical drill is provided for. While not engaged in the active service of the U. S. officers of the naval reserve shall be entitled to receive monthly pay amounting to one-fifth that paid officers of the navy of

corresponding rank; and enlisted men of the naval reserve shall receive monthly pay equal to one-quarter of that paid enlisted men of the navy of the same class.

In emergency and in time of war the naval reserve shall at all times be subject to be ordered into active service of the U. S.

The bill appropriates $1,400,000. All acts inconsistent with the provisions of this act are repealed. This act shall take effect and be in force from and after the date of its passage.—*Army and Navy Journal*, 18/3.

Secretary of the Navy Daniels announced on April 12 that more enlisted men are in the navy at the present time than ever before in the country's history. Secretary Daniels said that the enlisted personnel had reached the 54,000 mark. "There are now 54,011 men in the enlisted personnel," said the Secretary, "showing a gain of 6664 since March 4, 1913."—*Army and Navy Journal*, 15/4.

NAVAL TRAINING FOR CIVILIANS.—The naval training cruise for civilians under the direction of the Navy Department will begin August 15 and continue until September 12. The cruise will be made on reserve battleships. Civilians will be recruited by naval districts and the ships will be allotted according to the number of recruits accepted from each district. The qualifications are as follows:

The candidate must be a United States citizen in good standing and vouched for by two reputable citizens whose standings are known by the recruiting officer; must be between 19 and 45 years; minors must have consent of parents; must pass a physical examination; previous service in the army, navy or marine corps must have been honorable; must qualify in one of these classes—undergraduate of a college, university or technical school, graduate of one of these, able to demonstrate sufficient knowledge of maritime matters or experience with water craft to warrant enrolment, pilot or pilot apprentice, service on a merchant vessel for six months or more, six months' experience as a machinist, boilermaker, plumber, shipfitter, coppersmith, carpenter, electrician, engineer, fireman, telegrapher, radio operator, or must have a high school education and be engaged in a trade or occupation where the experience gained would be useful to the government in time of need.

The ships will cruise for about three weeks, during which the recruits will receive practical instruction, as well as be permitted to take certain optional special subjects, such as navigation, signaling, radio work, steam or electrical engineering, etc.

Recruits may enroll at any navy recruiting station or substation. Applications must be in by June 1.

At the expiration of the cruise the recruit will announce his intention as to whether or not he will volunteer for service in the navy in case of war within the next four years.

He will receive a certificate at the end of the cruise, specifying the nature of the duties he performed and the rating he is best qualified to fill.

Each man must deposit $30 when reporting on shipboard. This will cover the cost of his uniform and the cost of his board. If the amount required from him is less the balance will be refunded.—*Army and Navy Journal*, 29/4.

ATLANTIC FLEET ORGANIZATION.—On May 15 the battleships of the active Atlantic fleet will be organized as follows:

Fifth Division.—*Minnesota, Vermont, Michigan* and *South Carolina.*
Sixth Division.—*Delaware, Oklahoma, New York* and *Texas.*
Seventh Division.—*Florida, Utah, Arkansas* and *New Hampshire.*
Eighth Division.—*Nevada, Kansas* and *Wyoming.*

The *Pennsylvania* and *Arizona* will be assigned to the eighth division as soon as delivered and ready to join the fleet. The *Arkansas* will act

as the flagship of the eighth division until the *Pennsylvania* joins that division, when she will take up her station in the seventh division.—*Army and Navy Journal*, 13/5.

THE ATLANTIC FLEET.—The vessels of the Atlantic Fleet have engaged in strategical and other problems, spotting practice, torpedo defence, target and torpedo practice, mine and mine-sweeping exercises, torpedo battle practice and, in fact, every kind of practice that warships should engage in. In addition to the fourteen battleships, there were twenty destroyers and a number of vessels of the auxiliary fleet. The submarines engaged in exercises independently of the fleet and were based on Guantanamo and Guacanabo, Cuba. In addition to the exercises afloat, landing parties of bluejackets and marines were sent ashore for drill. Officers are very enthusiastic over the benefits gained from the maneuvers. The *Virginia*, during the exercises broke a shaft, while the *Georgia* experienced some difficulties with her boilers, and both of these vessels had to leave the fleet before the exercises were concluded and proceeded to Boston to have their defects made good. Considerable experimental firing was engaged in, and the firing as a whole, it is believed, when the records are made public will show a high state of efficiency.

Admiral Mayo declared that the maneuvers and target practice had been the most successful and satisfactory the fleet has ever held. "The fleet was never in better condition," said Admiral Mayo, "than it is to-day." This applies to both the ships and the men. We secured excellent results at the extreme range of 18,000 yards, which is an increase over the range of other exercises that have been conducted by the fleet. The maneuvers were on plans which developed some new ideas and which in the opinion of the officers greatly increased the efficiency of the fleet.

Schedule for the Fleet.—An extensive schedule for the Atlantic fleet from May 15 to Nov. 1 has been prepared at the Navy Department. From May 15 to May 20 the steaming trials of the first, second, third and fourth divisions will take place, ships operating singly, which will be followed by divisional exercises, June 12-17. The squadron exercises will take place between June 17 and June 19, off Newport, R. I. The fleet will take time from July 1 to July 8 to celebrate the Fourth of July, visiting such ports as may be designated by the Department. Operating from Narragansett Bay the fleet tactical exercises will take place between July 10 and 15. The athletic contests are scheduled for the first five days in August, while at Narragansett Bay. After another series of fleet tactical exercises from Aug. 7 to Aug. 12, the fleet will anchor at Narragansett Bay for machinery overhaul, ship drills and coaling. The program in the northern waters will be concluded from Aug. 20 to Sept. 1 by strategic maneuvers, after which the target practice on the Southern Drill Grounds will take place during the month of September. Docking and home ports will follow on November 1.

The destroyer flotilla, upon completion of repairs and reconnaissance operations off the New England coast, will assemble at Gardners Bay and make preparations to join the fleet. The submarine operations will be based on New London.

The first, second, third and fourth divisions of the Atlantic fleet, mining division, auxiliary division, and active flotilla of the destroyer flotilla, will base on Narragansett Bay from July 1 to Aug. 20. The dates at anchor in Narragansett Bay are July 8-10, July 15-24, July 29-31, Aug. 5-7, Aug. 12-20. The exercises July 24-29 include divisions operating in assigned areas; torpedo exercises; mining division and destroyer exercises. One division of destroyers will engage in joint operations with the army in defence of eastern New York. Aug. 4-10 one mining division and one division of destroyers will engage in joint operations with the army off Boston.

The active destroyer flotilla, after Nov. 1, will engage in torpedo practice at Narragansett Bay; the reserve flotilla will take part in neutrality, aviation and militia duty. The cruiser squadron during the summer will be engaged in police and patrol duty. It will join in fleet operations and hold target practice and steaming exercises and dock and overhaul as opportunity presents.

During periods designated for ships operating singly there will be steaming trials, school of the ship, rolling experiments, torpedo work, boat work, and ship drills. During the periods designated for division exercises there will be tactical maneuvers, towing exercises, torpedo and gunnery exercises, battle approaches, landing drills and night cruising, machinery upkeep. During the periods designated for squadron exercises there will be tactical and gunnery exercises. Ships will coal as required, coaling at sea when practicable.—*Army and Navy Journal*, 22/4.

ADMIRAL FISKE ON NAVAL POLICY.—Admiral Fiske, writing in his capacity as Aid for Operations, began his letter of Nov. 9, 1914, with the statement that "the United States Navy is unprepared for war." He pointed out that while our country had no expectation of going to war in the near future this was no reason for neglecting preparation.

"Some persons assume," Admiral Fiske wrote, "that a disposition to make preparation evidences a state of alarm in the mind of the person who proposes to make preparation. Yet such an assumption is entirely illogical. Wise men, and wise nations, show their wisdom in no better way than by taking wise precautions against possible dangers." No one could tell what the outcome of the present war would be, he continued, but there was the certainty that when the war "as at present outlined was ended it would be followed by a series of more or less violent readjustments of boundaries, insular possessions, treaties and agreements of every kind." He stated that it was not only his opinion, but the opinion of every naval officer with whom he had talked, that the United States for several years to come will be in danger of being drawn into war. "And when I say war," he wrote, "I do not mean war of the kind that we had with Spain, but war with a great power, carried on in the same ruthless spirit and in the same wholesale manner as that which pervades the fighting in Europe now. It is true that I cannot specify the country with which war is most probable, nor the time, nor the cause."

Only a combination of "high diplomatic skill and rare good fortune" were the things that would keep the United States out of war within the next five years, Admiral Fiske wrote, and he asked the questions as to whether this "was not a frail foundation to base our hopes of national safety on, whether it would be wise to close our eyes to the dangers that confront us, and would it not be wiser to look the dangers clearly in the face and take reasonable precaution to avoid them?" Then he took up the actual matter in hand, a comparison of our navy with "the navies we may have to meet in war." He stated that he found it unprepared in three ways: in its insufficient number of officers and enlisted men; in the lack of department organization; and in deficiency in training. Admiral Fiske wrote that "the number of suitable officers cannot be increased because it takes four years to get a midshipman through the Academy and several years afterwards to train him. But the number of enlisted men can be increased very quickly." The possibility of increasing the force of enlisted men through the naval reserves and the naval militia he described as a "visionary notion," since the experience of years of trial has led to "no naval reserve at all and less than 7000 incompletely trained militia." He stated that we wanted men right now, since "to man the ships which should be used in war we need 19,600 men more."

As to the second lack, that of departmental organization, Admiral Fiske found in this a situation that demanded what is known abroad as a "general staff." Our ships, he declared, "are well organized and pretty

well drilled, but the Department itself is neither organized nor drilled in a military way. "Perhaps," he continued, "this is nobody's fault, and may be attributed to the fact that our navy has never had to fight a serious enemy; certainly not in 100 years. But in my opinion there is an obvious military danger at present, and the Navy Department should be organized to meet it.

After reciting the manner in which such bodies work abroad, Admiral Fiske stated, "our Navy Department has no machinery for doing what a 'general staff' does. The closest approach to it is the 'general board,' which exists entirely as an advisory board to the Secretary of the Navy. It is highly valuable, but, as its name indicates, it is only a 'general board.' It does hardly one per cent of the duties that a 'general staff' would do. Having no executive authority and no responsibility, and being called upon to do a great variety of work, it has not the time to prepare specific plans, and has no means to see that even its general plans are ever carried out. If we compare our 'general board' with the 'general staff' of any other country, or with the Admiralty of Great Britain, and when we see what those 'general staffs' have been accomplishing during the past three months, we must become convinced that, unless we go on the theory that we shall always have peace, we shall be whipped if we ever are brought into war with any one of the great naval powers of Europe or Asia. We shall be like the lawyer who has not prepared his case when pitted against the lawyer who has prepared his case. We shall be as the French were before the Germans in 1870."

As to the navy's third weakness, deficiency in training, Admiral Fiske wrote that this was not due "to a lack of spirit or ability," but to a combination of a lack of personnel and departmental organization. What we needed most in this line of work was a "system of progressive training" such as the Germans and other nations have. We lack the training that secures the highest skill. And he concluded his argument along this line by stating: "If we are forced into war with a navy like Germany's or England's or Japan's our training should be at least as good as theirs; or rather our skill should be. It is impossible for me, or for anybody, to compare exactly the skill of our navy with the skill of other navies, but, on the theory that cause produces effect, we must admit that we have not had nearly so good a system to produce skill as other navies have. The developing of skill in the navies and armies of the other great powers is carried out with a vigor and persistency that we cannot approach, and has been directed by an organized intelligence that certainly has no superior, and probably no equal, in any other branch of human effort." Admiral Fiske brought his letter to a close by recalling to Secretary Daniels' attention the fact that the recommendations made by the Moody and Swift boards for the improvement of the organization of the Navy Department "were never carried out."

Deficiency in training, Admiral Fiske said, is due, not to lack of spirit or ability, but to a combination of insufficient personnel and lack of departmental organization, to which must be added lack of small ships. Because we have not had enough small ships to do work on the coasts of Haiti, Santo Domingo and Mexico, because our ships have been insufficiently manned and because the Navy Department has had no "general staff," which would devise and carry out a progressive system of training, lack of progressive training has resulted.—*Army and Navy Journal*, 29/4.

NAVIGATION

COAST FLASH SIGNALLING.—A new system of torchlight signalling is about to be started at all coast guard stations on the Atlantic coast for use in warning approaching vessels when running into danger, and to serve as means of communicating between patrolmen of the coast guard and vessels carrying Morse blinker lights. Until now the coast guard has made use solely of

colored warning lights, which are fired by the patrolmen, but no means have been provided whereby the men on beat on the beach could carry on communication by signal with outlying ships.

It is expected that before many days it will be possible for a ship to run in within two or three miles of the coast anywhere between Cape Cod and Cape Hatteras and be able to call up and communicate with a patrolman on the beach. At every coast guard station a lookout is maintained night and day in the tower of the coast guard building. These towers are shortly to be equipped with Morse blinker lights, which will make it possible to signal messages to greater distances than by the patrolman's hand torch.

Vessels fitted with wireless outfits can, of course, when near shore, always reach some coast guard wireless station, but the new blinker and hand torch signal systems will supply a means of communication for vessels not fitted with wireless equipment. The only difficulty in the way is that few coasting skippers understand the Morse code or are supplied with a signal lamp.—*Shipping Illustrated*, 22/4.

TO DETERMINE DIFFERENCE IN MEAN LEVEL OF ATLANTIC AND GULF OF MEXICO.—The U. S. Coast and Geodetic Survey has recently undertaken the task of determining the difference in the mean level of the water surfaces of the Atlantic Ocean and the Gulf of Mexico. A representative of the Survey has been sent to Florida to carry a line of precise leveling between the tide gauges at Ferandina and St. Augustine, on the Atlantic coast, across the Florida Peninsula to the tide gauges at Cedar Keys, on the Gulf coast. The question whether or not the Gulf is higher or lower than the Atlantic has been a subject of much discussion among scientists, and the results of this work should clear up the matter. The secondary benefit which will result from this line of precise levels will be the establishment of many bench marks of a substantial character whose elevations above sea level will be determined. These bench marks will be used by surveyors and engineers who work in the territory crossed by this line of levels.—*Shipping Illustrated*, 15/4.

FOGGY HOURS.—A bulletin, published by the Lighthouse Service, recently, gives the number of hours of fog or thick weather observed at 508 fog-signal stations annually, during the 30 years from 1885 to 1915. The highest annual average was made at Petit Manan, Me., where 1691 hours per year were foggy. The highest record for an individual year was at Seguin, Me., where in 1907 they had 2734 hours of fog, being about 30 per cent of the entire 12 months. In 1913, Calumet harbor, near Chicago, had 2269 hours of fog. The highest annual average made on the Pacific coast was at Point Reyes which had 1337 foggy hours, while, in 1915, the vicinity of San Francisco light experienced 2145 hours of fog.—*Marine Journal*, 6/5.

Studies of marine fog made during May, 1915, aboard the ice-patrol cutter *Seneca*, were described by Mr. P. V. Wells, of the Bureau of Standards, at a recent meeting of the Philosophical Society of Washington. Measurements were made three times daily of the number of persistent nuclei in the air per cubic centimeter, by the corona method of Barus. The number was found to be never less than 400, normally 1000, and on three occasions as high as 50,000. The nucleation was generally high in cyclonic areas, leading to the inference that the nuclei at sea are chiefly salt particles. *i. e.*, evaporated spray. The amount of water in a cubic meter of fog was found, by evaporating the fog electrically and measuring the humidity at the higher temperature, to be 0.7 gm. The fog particles were found to have a diameter of the order of .0005 cm. A rise of 1.4° C. in temperature would dispel this fog, and therefore a slight temperature "inversion" resulted in a shallow fog, not extending as high as the masthead.—*Scientific American*, 6/5.

ARCTIC ROUTE FROM ARCHANGEL TO VLADIVOSTOK.—The Russian Hydrographic Expedition, under Captain B. A. Vilkitsky, succeeded on September 16, 1915, in reaching Archangel by sea from Vladivostok. It is claimed that the expedition has demonstrated the navigability for merchantmen of the eastern part of the Arctic Ocean, which, from Bering Sea to the mouth of the Lena, had previously been but little explored. Another important task carried out by the expedition is the verification of the working of the wireless system established on the northern coast of Asia and of the principal transmission station at Mara-Sale.—*Nautical Gazette*, 13/4.

ITALIAN NAVIGATION LIGHTS EXTINGUISHED.—All lights on the coast of Italy and Italian colonies for the guidance of shipping are extinguished and vessels wishing to enter the port of Messina must hoist a pilot flag when 2¾ cables distant to the north of San Salvatore Point, when a boat of the Royal Italian Navy will guide them into the port.—*Marine Journal*, 29/4.

AN AUTOMATIC ICE INDICATOR.—Marine engineers and the travelling public in general will be interested in the advent of The Dinsley Patent Automatic Ice Indicator. This novel instrument—by means of visible and audible signals—records the temperature of the sea, and a ship equipped with the apparatus is given timely warning when ice is being approached. The apparatus is entirely self-acting. Each installation gives simultaneous signals in the wheelhouse, chart-room and captain's room. It has a wide range of usefulness, and will be of great service in foggy weather.—*Marine Engineer and Naval Architect*, April.

NEW APPARATUS FOR CONTROLLING A SHIP FROM THE BRIDGE.—Dr. K. Ito, manager of the engine works of the Mitsu Bishi Dockyard and Engine Works at Nagasaki, Japan, has invented an apparatus for controlling the movements of a ship directly from the bridge, so states the *Commerce Reports*. This invention is likely to have the most far-reaching results and will undoubtedly be adopted by shipping companies in all parts of the world. The device does away with the necessity of telegraphing instructions to the engine-room. The new apparatus, which enables the officer on the bridge to regulate the valves or reverse the engines directly, can move the ship at will in the time it usually takes the engineer to receive the message by means of the telegraph indicator.

The new apparatus prevents the possibility of misunderstanding and error. In case of accident, disputes frequently occur between the bridge and engine-room as to the indication of the engine telegraph. The device may be used with great advantage in foggy weather or in going in and out of a harbor or in anchoring. The greater mobility which a ship thus attains will often enable it to avoid a collision. The racing of propellers in stormy weather frequently causes great damage to the engines. This, however, is said to be prevented by the new apparatus. The navigator can adjust the engines instantly before the big waves are encountered.

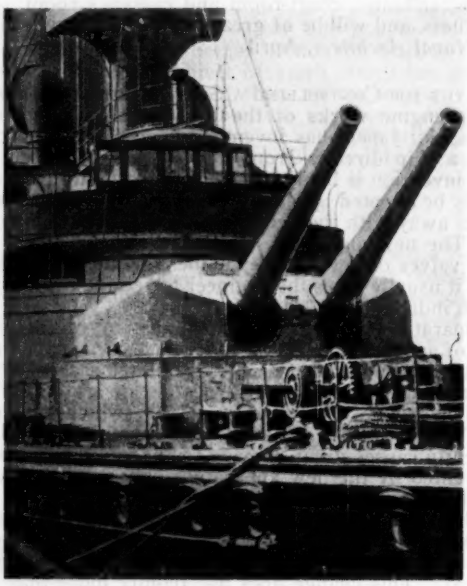
Unfortunately, details of the new device are not available at the present writing. It is known, however, that the device is worked by electricity and that in case of defect it can readily be detached and the engines worked in the ordinary way. This change does not require more than three or four seconds, according to reports.—*Scientific American*, 1/4.

TO PREVENT COLLISIONS BETWEEN STEAMERS.—The many collisions which have occurred recently led to a discussion with Mr. R. O'Neil, the inventor of an apparatus designed to counteract the effects of errors sometimes made in sudden emergencies on steamers approaching one another, as well as to show clearly and automatically the course of each vessel, the one moving towards it by means of a signal light, which indicates by color whether the rudder is to port or starboard. The usual white light shown on the mast head reveals the position of the vessel within limits, but the arrange-

ment of the invention referred to is additional to this and its utility is obvious as a supplement. It consists of a tell-tale mechanism which serves to show automatically the movements of the rudder by means of contacts and an electrical device which records at once by the red or green light whether the wheel has been put to port or starboard; there is also a recorder in the chart-room giving the confirmation of the order or a warning to the contrary to the officer on watch. Cases have occurred where the mast-head light has been seen, but not the side lights, and a doubt has arisen as to the course being steered by an approaching steamer, the combined speeds of the two bringing the time element into consideration, the doubt has to be quickly set aside by action which may or may not be correct. The sight of another light under the ordinary one serves to show the position of the rudder and the course being steered. Mr. O'Neil has another apparatus which records the movements of the engines going ahead and going astern, also automatic in its working.—*Marine Engineer and Naval Architect*, April.

ORDNANCE AND GUNNERY

BANDS OF TWO 12-INCH GUNS CRACKED.—Accidents to two 12-inch guns on the U. S. battleships *Louisiana* and *Michigan* became known on March 28, when Secretary Daniels appointed a special board to investigate them.



KRUPP 12-INCH 45-CALIBER NAVAL GUNS IN TURRET AT THE MAXIMUM ELEVATION OF 30°

The accidents occurred during recent target practice off Guantanamo. Capt. James H. Glennon, Superintendent of the Naval Gun Factory, heads the investigating board. Rear Admiral Strauss said the guns had survived their full "life of 120 shots." It develops that the accidents consist of the cracking of the bands. The guns did not burst, as has been reported in some of the news despatches. Both of the guns were relined after they had been fired the number of shots that are allowed for the life of a gun,

and the investigation which is being conducted by the board may result in some important change in the policy of the Department in dealing with big guns in the navy. The board has been working up on its investigation for three weeks at the Washington Navy Yard. It has been suggested that the cracking of the outer bands was due to the development of too much pressure in the contraction of the bands. This, it is thought, was more liable to be the cause of the accident than a fault in the steel of the

13.5-INCH GUNS OF THE OLD BRITISH BATTLESHIP "REVENGE" MOUNTED IN OPEN BARBETTES TO ALLOW HIGHER ANGLE FIRE THAN IS POSSIBLE WITH THE HOODED BARBETTES NOW IN USE—"REVENGE" BELONGED TO A CLASS OF SHIPS BUILT IN 1889-91 FOR POSSIBLE USE AGAINST LAND FORTIFICATIONS

outer layer of the guns. The guns were of the older type, and as a consequence the builders may not have been able to estimate the pressure exerted by the bands as the result of their contraction as accurately as the ordnance experts do now with their present facilities.—*Army and Navy Journal*, 1/4.

A GERMAN ANTI-AIRCRAFT GUN.—The Germans are using at the present time a 104 mm. anti-aircraft Krupp gun, 45 calibers long, which sends a projectile weighing 15½ kilograms, with a muzzle velocity of 800 meters, to a height of 4000 meters. It can be fired at the rate of 15 rounds per minute. The shrapnel shell which it fires is said to burst into 625 fragments. Guns of this type, as well as those of 120 mm., are the ordnance which defends Ostend.—*Scientific American*, 29/4.

GUN CONSTRUCTION CAPACITY OF GERMANY.—It is well understood among naval men that the limiting element in the question of rapid construction of a navy is the speed with which the guns and armor can be produced. Speaking upon this question, Mr. Bywater draws attention to the fact that during the naval agitation of 1909 in England, the then First Lord, Mr. McKenna, stated that it was not beyond the power of the Krupp

establishment to produce all the guns and armor necessary for eight dreadnoughts per year. This output would be additional to the enormous home and foreign orders for war material taken care of at Essen. Hence, having in view the increased size of the Krupp works, this authority believes that the Essen and affiliated factories could supply the guns and armor for all the dreadnoughts and other ships which Germany is capable of building.—*Scientific American*, 15/4.

BIG GUNS AND PROJECTILES.—At a meeting of the Faraday Society on Thursday, the 6th inst., Dr. Rosenhain delivered his cinematograph lecture on "The Making of a Big Gun." Sir Robert Hadfield, the president, was in the chair, and in introducing the lecturer he gave a few historical notes which are of more than ordinary interest at the present time. After alluding to the fact that Hadfields Limited had made a special study of projectiles for more than a generation, he mentioned that he had seen guns up to 16-inch caliber fired at various proving grounds, both private and government, including Shoeburyness, Portsmouth, Gavers, Le Creusot, Sandy Hook, Indian Head, Ochta, Meppen, Magdeburg, and elsewhere, and had studied results of tests at foreign proving grounds, at Spezia (Italy) and Kure (Japan). The largest gun he had seen fired was the 16-inch, weighing about 120 tons and being 35 calibers in length. There was at the time only one gun in existence of this caliber, namely, at Sandy Hook. The shot weighed 2400 pounds. On one occasion the range attained was 21 miles. The round he saw was fired at a comparatively low velocity, about 1400 foot-seconds, and was directed against a 12-inch hard-faced armor plate, inclined about 45 degrees. Hence the blow was more of a glancing than an impact one, and the plate was cracked but not perforated. He witnessed the round about a quarter of a mile from the gun, and was able to observe the fragments as they ricochetted out to sea over a distance of about 1¼ miles. The gun was designed for coast defence purposes, and he believed a number of similar pieces had been made for the Panama defence scheme.

Continuing, Sir Robert said that it must be borne in mind that, usually, when big caliber guns are referred to in the daily press, such as the 42 cm., they are really howitzers. In artillery parlance, a howitzer is not considered to be exactly a "gun." Its internal pressure very seldom exceeds 14 or 15 tons per square inch, and is generally not so much as that, whereas a real gun, such as is used in the navy or for coast batteries, has to stand a pressure of 20 tons per square inch.

Mr. J. A. Longridge, in his excellent series of papers given before the Institution of Civil Engineers between 1879 and 1884 on "Wire Gun Construction" and "The Construction of Heavy Ordnance," and also in his book "The Artillery of the Future" and the "New Powders," published in 1891, said that it would some day be possible—in fact, at the time of making the statement he said that he was prepared to do it—to make guns to stand up to 30 tons pressure. Sir Robert wondered why this subject had not been followed up. As regards our own service it is, he said, well known that we have 13.5-inch and 15-inch guns of the highest possible quality. The results obtained reflect great credit upon the British artillery engineer and the metallurgist, who by their combined efforts have produced guns, giving, as they have done, splendid results; in fact, no fault has been found with them in service. They are wire-wound, and he thought it might be of interest to state—and it was an open secret—that a certain foreign nation about two years before the war broke out, desiring to order big naval guns, sent a commission to visit the various big gun-making centers of the world, and this commission unanimously reported that the British wire-wound gun was the best which could be produced. Whatever the future has in store in the way of developments of the power of such guns, whether by means of increased caliber or by constructing calibers such as now made to stand higher pressure, he was quite sure that the

British artillery engineer and the metallurgist would continue to hold the proud position they at present occupy of building the most powerful guns the world has yet produced; that is to say, the muzzle energy of British guns outranks that of the guns of any other nation. The 16-inch American gun to which he had previously made reference, whilst not of the howitzer type, had nothing like so great a muzzle energy as, for example, our 15-inch naval gun, and the so-called big German guns, about which there had been so much talk in the papers, are, as regards their muzzle energy, very small and inferior weapons in comparison with ours. With some of our naval guns it would be quite possible to send a shell over Mont Blanc.

It may interest those present, said Sir Robert, to know that the life of a gun is really very short. There was an interesting article in *The Engineer* not long ago in which it was proved that the life of a modern high-velocity gun was not much more than three seconds. By this was meant that if one added up the length of time during which the projectile remained in the gun it would be found that under full service velocities the total time, and consequently the life of the inner gun tube, before erosion spoilt it, did not amount to much more than three seconds.

The modern gun, said Sir Robert, is really a heat engine, and it may interest you to know a few of the feats which I myself personally have been in touch with—that is, the results obtained from what may be termed the modern high-speed and great-power heat engine known as the gun. For example, I well remember many years ago at Shoeburyness a 9.2-inch armor-piercing shell being fired through a 9-inch armor plate known as "compound," that is, of combined iron and steel. The shot perforated the plate and backing, got out of the sand butt, and was recovered whole, and alongside it, to the general surprise, was found a small rabbit. A big gun for little game! Another instance I well remember which may be of interest was that a 9-inch wrought iron plate was being attacked by a 9.2-inch Whitworth shot. This plate was swung upon trunnions projecting from either side. In other words, before firing it would have been possible with comparatively little energy to make the plate swing backwards and forwards. But when the Whitworth shot was fired against this plate and perforated it, the plate was lifted from its trunnion seating and thrown away some 10 feet or 12 feet, yet the hole was properly punched in the plate. That is to say, before the plate had time to swing the shot passed through it. This brings home a fact which is perhaps not sometimes realized, namely, the enormously rapid action of the shot in perforating. For example, a 15-inch shot going through a 15-inch plate would perforate it in about one-thousandth part of a second—probably in even less time. It will be understood, then, what tremendous stresses are suddenly brought to bear upon the shot, and how the slightest flaw or imperfection of any kind will wreck it. Another instance may be mentioned. This refers to old experiments, but nevertheless is interesting. One of our 6-inch shot was fired against a 9-inch compound plate and recovered unbroken. It was so little injured that it was put in the gun and fired again. A second 9-inch plate was also perforated, the shot being recovered unbroken but slightly ground. It was fired a third time against a hard-faced plate, and being uncapped, of course broke. This illustrates how well a shot properly hardened and tempered can resist the enormous complex stresses suddenly brought to bear. In other words, the shot by means of its quality, and when possessing enough energy, is thoroughly master of its work against any type of plate without a hard face. To overcome the hard face the modern cap has been introduced. This enables even the hardest face to be perforated. It is curious to find that caps have to swell to the full diameter; in other words, the shot has to pass through the cap. The cap is not merely dispersed as might be expected. The action is, however, very sudden and the soft metal of the cap expands, so that it is really punched; the expansion or elongation of the mild steel taking place so quickly that it does not break until practically the full diameter of the shot

has been reached. It is no doubt owing to this fact and to the radial inertia of the cap itself that a modern cap is enabled so completely to protect the shot that the latter then passes unbroken through the armor plate attacked; that is, before the face of the plate is reached, certain support is afforded long enough to the point of the shot to give it time to transfer some of its energy to the plate attacked.—*The Engineer*, 14/4.

BATTLESHIPS TEST FORTIFICATIONS.—The battleships *Arkansas* and *New York*, carrying out a series of tests below Mobile, under direction of officials of the War and Navy Departments, stood 12 miles off shore and by indirect fire dropped 12- and 14-inch shells into a specially constructed sand and concrete fortification. Aeroplanes helped direct the fire, signalling hits and making photographs of the damage done.

None but army and navy officers were permitted to inspect the fortifications after the bombardment, and its result was not divulged. The tests are to form the basis of recommendations for future fortifications legislation.—*N. Y. Herald*, 15/3.

ENGLISH RIFLE GRENADES.—The English troops in Flanders are using a new weapon, the rifle grenade, the idea of which was suggested to its inventor, Martin Hale, by the successful employment of hand grenades in the Russian-Japanese War.

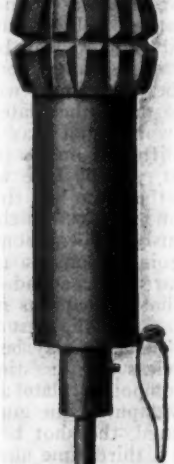


FIG. 1.—The Hale Rifle Grenade

The Hale rifle grenade (Fig. 1) is composed of a brass tube 1.5 inches in diameter which incloses a smaller tube. The space between the tubes contains 4 ounces of a very powerful explosive, which is exploded on impact by a cap containing fulminate of mercury, attached to the front end of the small tube. The cap is suitably protected against accidental explosion. The front end of the outer tube carries two heavy steel rings, nearly separated by deep grooves into 24 parts, which are torn asunder and hurled in all

directions by the explosion. To the rear end of the small tube is screwed a steel rod which is inserted in the barrel of the rifle.

The grenade is thrown 150 yards by a powder charge of 30 grains, 300 yards by 45 grains. The grenade can also be thrown by hand. For this use the rod is unscrewed and the grenade is thrown by means of a cord attached to a peg provided for the purpose. The grenades can be used, furthermore, for destroying buildings, bridges, railways, etc. In such cases the rod is removed and the fulminate cap is replaced by a fuse.

A soldier can carry without inconvenience four grenades attached to the back of a belt. If necessary he can carry a larger number, as the weight of the grenade is small.—*Scientific American Supplement*, 25/3.

MODERN FORTIFICATIONS.—That fortifications are still a gigantic factor in the science of warfare will, in the opinion of military experts, be proved if the Allies attempt to capture the German fortifications, particularly the coast defence forts, where are mounted 15- and 17-inch guns behind ramparts designed to resist projectiles from 12- and 13-inch naval artillery.

The latest type of German fortification appears very much like a huge tortoise, lying prone upon the ground. The heavy steel dome which protects the entire battery is curved to prevent the impact of gunfire at an acute angle, and it can be rotated around its axis by electric power. The rifles within the dome are mounted like naval guns, and the entire operation of serving and loading the pieces savors of a battleship rather than a fort. The sighting and loading mechanism of the guns and the rotating machinery of the barbette complete the contents of the turtle-like structure. The ammunition magazine and hoist, the engines for supplying power, and the living quarters of the gun crews are situated in concrete vaults sunk in the earth below the barbette.

One of the novel ideas incorporated in the construction of this type of fortification is that the guns are not turned of themselves, as is usual in land forts, but the entire barbette is revolved until the guns are on a line with the target. Then the guns are raised or lowered, according to the range specified. Here, again, is a striking innovation. Instead of having long, narrow slits which would permit of the guns being elevated or depressed, but which would at the same time admit of the easy entrance of shrapnel, the guns themselves are laid in embrasures and the breeches are moved up and down. Thus the desired effect is obtained without danger to the gun crews.

The heavily protected steel dome, designed to deflect the largest of modern projectiles, and the fact that forts of this nature make use of high-angle fire while attacking battleships would of necessity have to use direct fire, render these fortifications impregnable to naval attacks. It is the opinion of military experts that a hostile fleet could be easily sunk by the guns of these forts before it could inflict any material damage.

Probably the most formidable of the German forts of this nature is that which guards the entrance to the Kiel Canal, where is gathered the entire German surface fleet. This fortress contains a mortar battery, mounting 11- and 16-inch pieces, capable of sending tons of projectiles smashing through the decks of battleships eight miles away. The direct-fire batteries are placed above this battery in tiers, the topmost tier being 176 feet above sea level. In these tiers the heavier pieces are placed below, and range in caliber from 13.9 to 17.7 inches. The lighter ordnance in the upper tiers consists of 8.2-, 9.4-, 10.2- and 11-inch rifles.—*N. Y. Times Magazine*, 19/3.

THE COST OF ARMOR PLATE.—Declaring again that the Bethlehem Steel Company can make steel cheaper than the United States can in a government plant, Charles M. Schwab and Eugene G. Grace, of the steel company, have issued another bulletin addressed to members of Congress as a protest against the government's plan for establishing its own armor plant. "We have a plant now built that cost us $7,000,000," the bulletin states. "If a government plant is built ours is rendered useless and valueless. The whole of

our investment will be sacrificed. Any return, however small, on the cost of our plant—any contribution toward the administrative expenses—is better than the loss of the whole plant." The bulletin reiterates the offer of the company to reduce the price of armor plate from $425 to $395 a ton, and calls attention to the fact that some people have said this proves the company has made inordinate profits in the past. "The fact is," the bulletin continues, "that armor manufacture is and has been the least profitable branch of steel making. Japan has a government plant. She pays wages very much lower than are paid in this country. Her people are known for efficiency, yet the actual cost of her armor plate (according to official data) is $490 a ton. Is there any reason to suppose that the American Government could do any better? We have offered to reduce our price, not because the present price is too high. The shop cost of producing armor was found by Senator Tillman's committee to be about $262 a ton. Those figures represent our own experience—if our plant ran at full capacity. Senator Tillman's production cost of $262 a ton, running at full capacity, did not include administrative expenses, it did not allow any interest on the value of plant or working capital, it did not provide for insurance, taxes or depreciation. Such items would in one way or another have to be met by the government just as much as by a private manufacturer.

"The naval estimates call for 24,000 tons of armor a year for the next five years. If we receive orders for 8000 tons a year we can run our plant at two-thirds capacity, and reduce our price. In the past our plant has run at an average of one-third capacity. That is why $425 has been a low price. If we could have run at two-thirds capacity, as is now possible, we could have made a reduction then. To provide for all items of cost with our plant running at two-thirds capacity would make the total cost about $399 a ton. This covers merely shop cost plus the carrying charge on the plant; it covers no allowance for profit. We offer the reduced price named, or we agree to accept the findings of the Federal Trade Commission as to what a fair charge would be. Is it likely that we would suggest, as we have done, an investigation by the Federal Trade Commission if we feared their findings would show extortion in the past?"—*Army and Navy Journal*, 29/4.

SENATE VOTE FOR GOVERNMENT ARMOR PLATE FACTORY.—The U. S. Senate by a vote of 58 to 23 passed March 21 the Tillman bill appropriating $11,000,000 for the purchase of construction by the government of an armor plate factory. The Democrats voted solidly for the measure and were joined by nine Republicans.—*Shipping Illustrated*, 11/3.

ENGINEERING

SPEED AND UNDERWATER PROTECTION.—The new building program to be submitted to Congress about April 25 will include 800-ton submarines and 35-knot scouts, outclassing those of any foreign navy. The scouts will have geared turbines for reasons of economy of fuel at cruising speed. The new destroyers will be of 35, instead of 32 knots' speed. A change has also been made in engineering practice. The old standard was 20 horse-power to the ton of engine weight. This was far below the ratio set by British and other foreign engine designers and in part accounts for the slower speed of American battle craft. The figure was raised to 30 horse-power per ton some months ago, and recently the possibility of 45 horse-power per ton has been said to be possible through new engine designs. Battleships 43 and 44 will make 21 knots under normal conditions, despite the fact that they will carry proportionally greater armor and underwater protection than any previous ships. After long deliberation and much study at the Naval War College it has been determined that the additional speed which foreign heavy ships may have does not affect the battle efficiency of the squadrons as compared to American craft. The additional cruising radius and armor

of the American ships has been shown to more than offset the speed difference. Naval constructors believe that delay in the construction of battleships 43 and 44 has been more than justified by the increased protection against torpedo attack worked out for them. It is confidently stated that they are 50 per cent better defended below the water-line than any battleships now afloat or projected. This, in addition to speed increase, is most satisfactory to the constructors who urged that the designs be held up pending the completion of experiments.—*Shipping Illustrated*, 15/4.

BIDS FOR ELECTRICAL PROPELLING MACHINERY.—Bids opened by the Navy Department for electric propelling machinery to be installed in the battleships *New Mexico* and *Tennessee* were awarded as follows: General Electric Co., $1,122,000; Westinghouse Electric Co., $1,176,000.—*Shipping Illustrated*, 15/4.

HEINRICH BECK'S SEARCHLIGHTS ACCEPTED.—The Secretary of the Navy said on March 11 that he had placed an order for eight of the new powerful searchlights invented by Heinrich Beck, German inventor, to go on board the battleship *Pennsylvania*, and that Mr. Beck's lights would be used also on the battleships *Nevada* and *Oklahoma*.—*Army and Navy Journal*, 18/3.

NEFF SYSTEM FOR SUBMARINES.—The Secretary of the Navy has written a letter to Representative Lemuel P. Padgett, chairman of the House Naval Committee, asking for an appropriation of $340,000 to test the Neff system of propulsion for submarines, which is designed to increase their radius of action and to do away with storage batteries, which have been the cause of frequent accidents. Under this system the same power propels the boat under the water as on the surface. The report of the naval board upon a trial of an experimental boat which was built on the Pacific coast has convinced the naval authorities that the Neff system is a mechanical success. Naval officers who have investigated the subject believe that it will increase the speed and radius of action of undersea boats and will make them more effective. The question has been raised about whether the noise of the engines under the water and the wake of the air bubbles which would come from the exhaust of the oil engine of the Neff system would betray the presence of a submarine. This is a military question, and to settle it the Secretary proposes to remodel one of the old submarines by installing the Neff system and test it under actual conditions. This noise is caused by a final expansion of the gas after it has left the cylinder. Since building the first boat it is asserted that the inventors, who have been working on it, have silenced the exhaust. To prevent the submarine from making a wake of foam the expanded gases are condensed and drawn inboard by mechanical exhausters and in turn pumped overboard. Underneath the hull the exhaust is sprayed out and carried back to the propellers. If there are any bubbles left they are churned up by the propellers as by an egg beater, thus eliminating any train of air bubbles.—*Shipping Illustrated*, 6/5.

APPLICATIONS OF THE AMPEREHOUR METER IN SUBMARINES.—One of the most interesting applications of the meter has been in connection with the batteries used on submarines. We have here a condition somewhat similar to that described in connection with central station batteries; that is, a comparatively low discharge rate; a normal charging rate and a very heavy discharge rate. In this case there were serious objections to the use of any type of relay or distant dial mechanism and it was desired to show on one dial face at all times the condition of the batteries. Two meters are used, one of proper capacity to accurately meter the low discharge for lights and auxiliary apparatus when in port, the other of proper capacity to accurately meter the high discharge rates when running submerged and the normal charging rate, which is comparatively high. Two meters are mounted on the same base and connected through differential gearing to a single hand on a large circular dial.—*Sibley Journal of Engineering*, April, 1916.

SUBMARINES

U. S. SUBMARINE "L-1."—The submarine *L-1* was completed, delivered and accepted by the U. S. Government and placed in commission on April 11. This boat was built under contract for the United States Government by the Electric Boat Company, the actual construction of the vessel taking place at the works at Quincy, Mass. Owing to minor engine and battery troubles, it has taken practically one year from the time this boat was first tried to meet all the government's requirements. These have, however, been not only met, but surpassed in all respects and the six other *L* boats under contract with the Electric Boat Company will now be rapidly completed and delivered to the government; two more will be turned over to the government this month and the others in May and June. The *L-1* is the biggest submarine in commission in the United States Navy, for it is 170 feet over all. It differs in appearance from the usual type in that its bow is ship-shape, not rounded, thereby adding materially to its speed. It is propelled by Diesel oil-burning engines and carries four torpedo-tubes in its bow.—*Army and Navy Journal,* 22/4.

TO COMPLETE SUBMARINES IN 19 AND 21 MONTHS.—The Electric Boat Company, which was the lowest bidder recently for the two 1500-ton fleet submarines, has notified the Navy Department that it can reduce by about a year the time limit for the construction of these two vessels. Instead of taking 31 and 33 months, respectively, it will be able to complete these vessels in 19 and 21 months.—*Marine Journal,* 11/3.

THE SUPER-SUBMARINE.—That that "super-submarine is a type that can seriously affect our naval supremacy is a question that can safely be answered in the negative," is the opinion of *The Engineer,* of London, in a discussion of that type of ship in a recent issue. In a brief review of the active history of the submarine the paper points out that at the beginning of the present war the latest type of German vessel—the *U-33,* then approaching completion—was about 220 feet long, with a submerged displacement of 830 tons and propelled by twin-screw Diesel engines, aggregating 2400 brake horse-power and giving a speed of 17 knots. They have proved their ability to remain at sea for lengthy periods—about as long as a big torpedo-boat destroyer—and they can be fitted for mine dropping. As destroyers of commerce they have amply demonstrated their powers. *The Engineer* states that "the seagoing types capable of sinking *Lusitanias* and *Arabics* have been blotted out by the half-dozen of the other types of ships expressly designed at attend to them." The journal sets the limits of a larger type to a Diesel engine capable of producing 3600 horse-power, and declares that if any submarine is built to require more power than that there will have to be a return to steam, with oil-fired boilers, and to geared turbines, as the lighest known method of using steam in engines. *The Engineer* reasserts the success the English Navy has had in "dealing with submarines of small, medium and large types in which it has been remarkably successful," and declares that "from a purely military point of view the submarine has not yet achieved a very great deal, and it may be reasonably suggested that the possibilities of the German submarine have been wasted on spectacular frightfulness."—*Army and Navy Journal,* 15/4.

A SUBMARINE CHASER.—Bowes & Mower, architects, of Philadelphia, have secured approval from the Navy Department to the plans of a yacht to be built for Commodore Chas. Longstreth, Corinthian Yacht Club, which will be fitted as a submarine chaser. Her speed will be 30 miles an hour. Dimensions, 73 x 11.6 x 3.10 feet draft. She will be of 900 horse-power and will mount a 3-pounder gun.—*Shipping Illustrated,* 29/4.

SUBMARINE NETS FOR THE NAVY.—A prominent American business man, who has recently returned from an extended business trip among the

belligerent nations of Europe, tells us he was reliably informed that the Allies had "netted" a total of 130 submarines. Not long before this our Navy Department learned, through its own private sources of information, that the total number of submarines captured or destroyed by this and other means was 127. The stout, steel chain-net, suspended from buoys at the surface, has been found to be a most effective means for keeping the submarine out of certain waters to be protected. Moreover, long sections of netting towed between destroyers or, better, between trawlers, have proved

EXPLOSION OF THE TORPEDO FIRED AGAINST A VESSEL BY A GERMAN SUBMARINE

(Photograph by the *Berliner Illustrations-Gesellschaft,* from Feature Photo Service)

—*N. Y. Times.*

most effective in intercepting and dragging into shoal water the submarine craft of the enemy.

Many months ago Admiral Fletcher, recognizing the importance of this means of defence, asked the Department for netting of sufficient size and in sufficient quantity to enable the fleet to do some experimental work in this direction. He secured some netting, which, on test, proved to be of too

weak construction for the effective stopping and catching of submarines. Outside of this, the navy is altogether without this most valuable element in the protection of our harbors and roadsteads, and of the fleet itself, against submarine attack.

Last year the *Scientific American* suggested that, in view of the enormous damage which could be done to our fleet, to our dockyards and to the merchant shipping in our various ports, by an unheralded submarine attack, it would be advisable to provide the navy with several miles of specially constructed netting of the kind which has proved so successful in European waters.

Ordinary prudence, indeed, would lead us to go even further than that and, at once, throw netting across the approaches to our dockyards and around the waters which are used as anchorage ground during our fleet maneuvers. For we should remember that the largest submarines employed in Europe to-day run from 800 to 1500 tons in displacement. Many of our naval officers, indeed, consider that it is quite possible Germany may have built one or more type ships of 2000 tons, designed for special long-distance service. Undoubtedly there are submarines afloat which could make the transatlantic passage without convoy, fill up their oil bunkers in the West Indies. and then make an early morning surprise attack on our dockyards, in which, particularly at this outfitting season of the year, the finest of our dreadnought fleet might be sunk at its moorings.—*Scientific American*, 6/5.

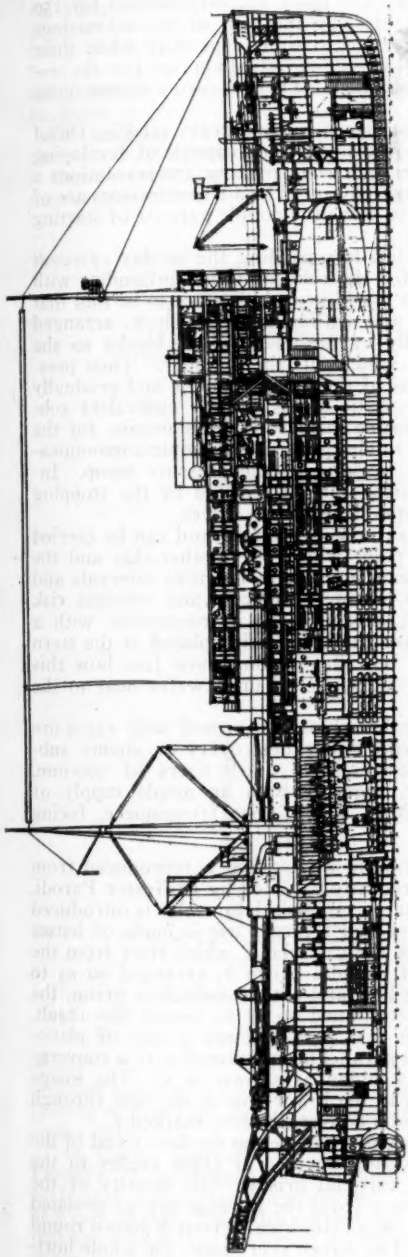
TORPEDO NET FOR THE "OKLAHOMA."—A torpedo net of steel, similar to that used for many years in the British and other navies, is to be placed about the top sides of the U. S. battleship *Oklahoma*. The net will be rolled up on the sides, and when in use will be extended out by booms in the usual manner.—*Army and Navy Journal*, 20/5.

SUBMARINE MOTHER-SHIP BUILT BY THE FIAT-SAN GIORGIO.—The well-known Italian firm, the Fiat-San Giorgio, of Spezia, has built a special submarine mother and depot ship both for the home government and for the Brazilian Navy, designed to discharge manifold duties. They are mobile supply and repair bases containing tubular testing docks and capable of promptly salving a sunken submarine if within the reach of divers. This, as will be readily recognized, is a very notable advance over the simple testing dock evolved by the same enterprising company a few years ago, for the present ships are self-contained and capable of making extended cruises. In turn, they add very materially to the strategic value of a flotilla of submersibles so convoyed.

In order that we may get a fair idea of the design of these novel vessels the following general particulars and principal dimensions are given:

Length between perpendiculars	328 feet	00.0	inches
Beam, maximum	51 feet	6.0	inches
Draft when ready for sea and all stores aboard	13 feet	11.25	inches
Total length of cylindrical testing dock	209 feet	11.66	inches
Maximum useful length of dock (internal)	180 feet	2.25	inches
Diameter of entrance (rear end) of cylinder	24 feet	9.66	inches
Internal diameter of cylindrical testing dock	23 feet	4.00	inches
Motive power, two heavy-oil engines driving twin screws.			
Maximum speed		14	knots
Radius of action, at 10 knots speed		4,000	knots

When mothering a flotilla, this depot ship is able to fill four times the fuel tanks of the smaller submersibles and to do a like service three times for the big boats as well. Thus, while tripling or quadrupling, as the case might be, the radius of action of her submarines, this unique craft can cover on her own account a matter of 4000 nautical miles. The operative



INBOARD PROFILE OF SUBMARINE MOTHER-SHIP BUILT BY THE FIAT-SAN GIORGIO, SPEZIA, ITALY
(From designs by Major Laurenti)

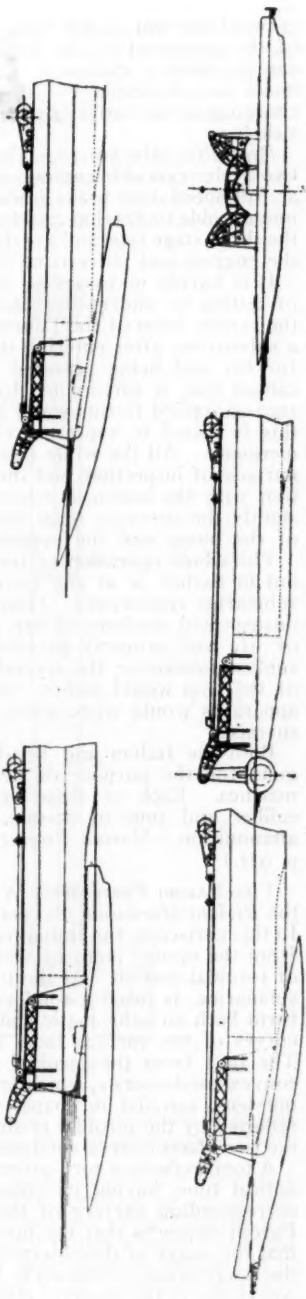


DIAGRAM SHOWING METHOD OF RAISING A FOUNDERED SUBMARINE WITH GEAR AT THE STERN OF THE MOTHER-SHIP

crew of the ship is 140 men, and there are spare accommodations for 150 of the personnel of the flotilla. In this way the men of the submarines can be given a chance to rest from time to time, especially when their boats are alongside for repairs, refueling, revictualing, or for the recharging of the batteries of the submersibles. There is also a commodious sick bay.

Propelling Machinery.—The ship is driven by two heavy-oil Fiat-Diesel two-cycle reversible engines, each of six cylinders and capable of developing at full speed 3200 brake horse-power, and when making 130 revolutions a minute, able to develop 2200 brake horse-power. The air compressors are of the three-stage type and are designed to serve the double purpose of starting the engines and pulverizing the fuel.

It is hardly necessary to go into details regarding the *modus operandi* of testing an underwater boat; but for the sake of those unfamiliar with the earlier form of the Laurenti dock it will probably suffice to be told that a submarine, after entering the dock and settling upon the blocks arranged for her and being centered vertically by means of other blocks so she cannot rise, is surrounded by water which fills the cylinder. Then pressure is applied to this water by means of the plunger pump, and gradually this is raised to represent the hydrostatic stress of any equivalent submergence. All the while there are people inside of the submarine for the purpose of inspection, and the officer in charge is in telephonic communication with the engineer directing the working of the pressure pump. Instantly the pressure upon the submarine can be reduced by the stopping of the pump and the opening of suitable exhaust valves.

The whole operation of testing is exceedingly simple and can be carried out in harbor or at any convenient point where the mother-ship and the submarine rendezvous. These tests can be made at frequent intervals and unsuspected weaknesses can thus be promptly detected and needless risk of life and property avoided. For salvage work in connection with a sunken submarine, the special windlass and the derrick placed at the stern of the ship would suffice. Some of our illustrations show just how this apparatus would work when raising a foundered underwater boat to the surface.

Both the Italian and Brazilian mother-ships are armed with rapid-fire guns for the purpose of dealing with either destroyers or enemy submarines. Each of these vessels carries four quick firers of 100-mm. caliber and four of 57-mm. caliber, together with an ample supply of ammunition.—*Marine Engineering*, May, 1916. (See frontispiece, facing p. 931.)

THE PARODI PERISCOPE.—We illustrate in Figs. 1 and 2, reproduced from the *Rivista Marittima*, the periscope recently patented by Professor Parodi. In this periscope, the Italian review states, no essential novelty is introduced from the optical point of view, except that a larger use is made of lenses of toroidal section. At the top of the optical tube *a*, which rises from the submarine, is fitted a total reflection toroidal prism *b*, arranged so as to form both an achromatic converging lens and a total reflection prism, the curves of the various faces being determined so as to secure this result. The rays from the toroidal prism *b* first pass through a pair of plano-convex condensers *c*, which produce a parallel beam extending to a converging lens, toroidal in shape, which is added as shown at *d*. The image reflected by the toroidal prism passes to the lower end of the tube through the two plano-convex condensers *e* and a converging lens marked *f*.

A total reflection toro-prismatic system, *g*, is fitted at the lower end of the optical tube, having its conical reflecting surface at right angles to the corresponding surface of the upper toroidal prism. The novelty of the Parodi device is that the luminous rays from the horizon are so deviated that the image of the objects is given on a cylindrical screen *h* placed round the lower prism, as shown in Fig. 2. The screen reproduces the whole horizon visible to the observer placed at *i*, and who views it through the cylindri-

cal glass screen *f*. The image can be enlarged. The conditions of an observer who views the horizon direct are thus exactly reproduced, there being added the possibility of directing from the screen the principal problems relating to the course of the boat by combining the picture with a fixed index and the indications of a compass which are projected on the screen *h*, as shown in Fig. 2.

The compass, marked *k* in Fig. 1, has a transparent card, and is fitted in the conical cavity of the lower prism; it is lighted from the top, and there is thus projected on the screen the entire graduation of the card through the conical mirror *l* and the annular lens marked *m*. The apparatus is

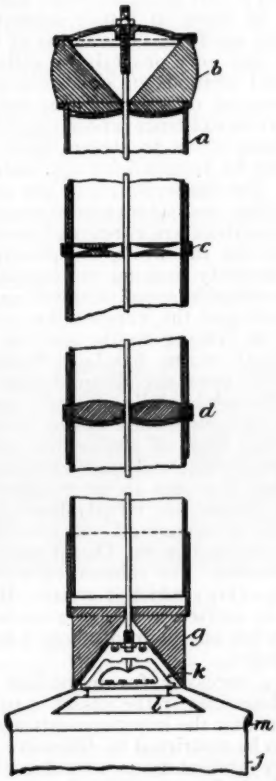


FIG. 1

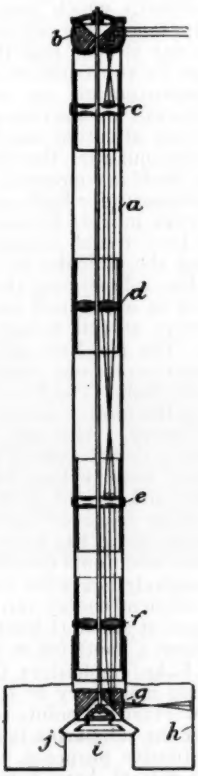


FIG. 2

destined to act as a "perigraph," but it can act also as a periscope by simply placing in front of the lower prism *g* a simple and supplementary rotary ocular device.

The Italian journal from which we quote cannot vouch for Professor Parodi's "oloperigraph" being found in everyday practice so simple and perfect as it appears at first glance. It believes that the great difficulty will be a lack of light for a clear direct sight; in regard to this it should be noted that the images are projected inside a kind of dark chamber, cylindrical in shape, limited by the screen, and are thus viewed under very favorable conditions.—*Engineering*, 14/4.

SOUS-MARINS SANS PÉRISCOPE.—Selon un télégramme de la Haye à l'*Evening News*, les Allemands construiraient en ce moment-ci, un nouveau type de sous-marin dépourvu de périscope. Une ingénieuse combinaison de lentilles et de miroirs permet au navire d'observer ce qui se passe à la surface. Ce système empêche le sous-marin de naviguer aussi profondément que les submersibles munis de périscope, mais ces inconvénients sont compensés par le fait que la présence du navire est beaucoup plus difficile à constater.—*Journal des Debats*, 10/4.

STATUS OF THE SUBMARINE.—In the series of articles on submarines by Mr. Simon Lake, which is concluded in this issue, attention has been directed to the improvements which must be made in future submarines to make them effective weapons for offensive warfare. The status of the submarine as it exists to-day is such that it may very properly be called a perfected craft as far as its construction and methods of operation are concerned. No further improvements are essential or necessary in the principles of operation. Types of submarines are in existence whose capabilities are such that when proper attention has been given to stream lines, stability and pressure-resisting qualities, they may be designed for any desired service, so far as the boat itself is concerned. But the weakness of the vessel lies in its propulsive machinery, for both surface and submerged operation.

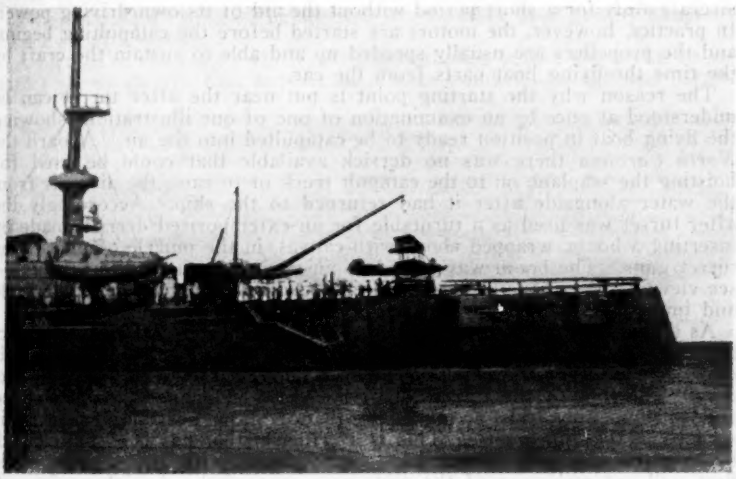
As far as prime movers for submarines are concerned, steam machinery has generally been found unsuited for the work, the principal objections to its use being the difficulty in instantly housing the comparatively large smokestack when submerging, the valuable space occupied, the unavoidable storage of heat in a confined space, and the impossibility of immediately getting underway at full power on coming to the surface after a long submergence. The gasoline (petrol) engine has been discarded because of the numerous explosions resulting from the accumulation of dangerous gases within the hull. The Diesel engine, while generally accepted at the present time as the motive power for submarines, has by no means proved entirely satisfactory. Although this type of engine has given excellent service in surface vessels, where the weight and space occupied are not important features, nevertheless, when it comes to an installation in a submarine, the size and weight of the engine are strictly limited, while at the same time a wide range of speeds is demanded. Reversibility is also a desirable feature, but it has been obtained in the Diesel engine only at the expense of much additional complication. For submerged work, the storage battery is excessively heavy for the energy which it stores. It is also bulky, so that only sufficient energy can be carried to propel a modern submarine while submerged at about 11 knots for one hour, at about 8 knots for three hours, or at about 5 knots for 20 hours.

While Mr. Lake emphasizes the necessity for immediate improvement in the propelling machinery of submarines if the vessel is to be successful for offensive warfare, he points out that the improvements are by no means so important if the submarine is to be restricted to defensive warfare only. For purely defensive purposes, the present types of submarines, notwithstanding their defects, have conclusively proved in the present war their capability of maintaining their lines of defence, while in addition some of them have found time to do effective offensive work. As a strictly defensive weapon, Mr. Lake has laid special stress on the type of craft which he has termed the "amphibious submarine"—that is, a small vessel of about 200 tons displacement which can be hauled out of the water on special trucks and transported at high rates of speed over the railways on land to points of attack. Such vessels, Mr. Lake estimates, could probably be built for about $300,000 (£61,500) each, capable of making a speed of 10 knots on the surface and about 8 knots submerged. In the United States such small boats can be transported from New York to San Francisco in three days, from New York to Boston in five hours, or from New York to New Orleans in 36 hours in perfect safety.

Such a system of coast protection, enabling the quick mobilization of a large number of submarines at any threatened locality, while a distinct novelty, has much to recommend it from the standpoint of economy, utility and expediency.—*Marine Engineering*, 29/4.

AERONAUTICS

"NORTH CAROLINA'S" AEROPLANE CATAPULT.—Fundamentally the catapult consists of a narrow gauge runway about 50 feet long, which is raised above the *North Carolina's* after main deck a matter of something like four feet, and supported upon trusses at suitable intervals. The runway is permanently secured to the deck in this particular case, but the intention is to make other installations in portable sections which, when assembled and aligned, will be held temporarily to the deck by means of suitable lewis bolts. The length of the runway in future installations will be determined



AEROPLANE CATAPULT ON U. S. S. "NORTH CAROLINA"

entirely by the space available, and when placed aboard turret ships the track will probably extend from the after side of the aftermost barbette to the rail at the stern. There is a reason for this apart from the desirability of having as much of a run as possible in order to accelerate the car up to launching speed.

The runway is built of steel angles, and the trucks of the launching car are guided by the flanges of the angle-iron tracks, while other flanges on the car hold the truck down when the flying boat acquires an impulse to rise. In the original model the launching car was thrown overboard and dropped away from the flying boat. This, of course, had to be changed, and the car now remains aboard the ship. The truck brings up against a buffer at the end of its run, or as soon as the holding-down latch, which grips the flying boat, is released by a stop on the track. In a distance of about 12 inches the shock of the car's impact is absorbed, and the buffer, in reacting, causes the truck to recoil and travel well back toward the starting position.

In the first catapult air was stored in a leaky tank improvised at the time. To-day the air is supplied directly from the torpedo air service of the *North Carolina*, and at a pressure of 300 pounds per square inch. The

starting valve was not all that Captain Chambers desired in his original machine. It was of a balanced type, and was opened progressively by means of a simple wedge-shaped cam which was attached to the traveling-block on the head of the piston rod. It answered reasonably well at the time, but was not perfect. Now a suitable modification has been made in the starting valve, suggested by the tests of 1912, and the progressive speeding-up of the piston and, consequently, the acceleration of the launching car is effected with great smoothness.

The actual travel of the piston is in the neighborhood of 48 inches, and the piston rod is connected with a wire rope purchase which multiplies the travel of the piston, so that the car at the other end of the rope is drawn from one end of the runway to the other. In short, it is an adaptation of the mechanism commonly employed for luggage lifts. In this way the car is pulled along the runway or track at a speed gradually rising to 50 miles an hour, and when this velocity is attained the flying boat is released and rises clear of the ship. Indeed, the momentum is sufficient to keep the aircraft aloft for a short period without the aid of its own driving power. In practice, however, the motors are started before the catapulting begins, and the propellers are usually speeded up and able to sustain the craft by the time the flying boat parts from the car.

The reason why the starting point is put near the after turret can be understood at once by an examination of one of our illustrations showing the flying boat in position ready to be catapulted into the air. Aboard the *North Carolina* there was no derrick available that could be used for hoisting the seaplane on to the catapult truck or to raise the aircraft from the water alongside after it had returned to the ship. Accordingly the after turret was used as a turntable for an extemporised derrick made by inserting a boom, wrapped about with canvas, in the muzzle of one of the turret guns. The boom was stayed to an upright secured upon the top—see view above—of the turret. This provided ample reach over either side and immediately above the starting station of the runway.

As a regular thing this arrangement has drawbacks, and is even objectionable, because the guns might be injured. However, this objection is easily overcome by the employment of a longer boom secured at its heel on the forefoot of the turret. This boom could be more easily shipped and unshipped by this arrangement than is now possible, where it is secured in the gun muzzle. This is a criticism that has been anticipated, because the installations that have been designed for the regular battle fleet will not make use of the guns as a part of the derrick equipment. The outfit aboard the *North Carolina* is, in fact, experimental, and in various details will be modified in the regular service. These changes, however, are not basic in their character, but matters of refinement. The prime point to be borne in mind is that the aeroplane catapult has reached a stage of development that has quite satisfied the experts of the United States Navy.—*The Engineer,* March 17, 1916.

SUPER-ZEPPELINS. *By Baron Ladislas d'Orcy, Member, American Institute of Aeronautic Engineers.*—It is common knowledge, that for some time past a new type of Zeppelin, far more powerful than any of its predecessors, has been commissioned with the air service of the German Navy. The recent destruction, by the agency of the Allies' anti-aircraft artillery, of two of these vessels has now afforded the long-sought opportunity for getting a closer view of this type of aircraft—which for sake of convenience we shall term a super-Zeppelin.

A layman might hardly discern any change in the outward appearance of a super-Zeppelin, when compared with previous types; it appears, however, upon examination of what remained of the vessels destroyed at Révigny (the *LZ-77*) and in the mouth of the Thames (the *L-15*), that the hull, steering organs and propelling apparatus have been re-designed to a great extent on the latest types.

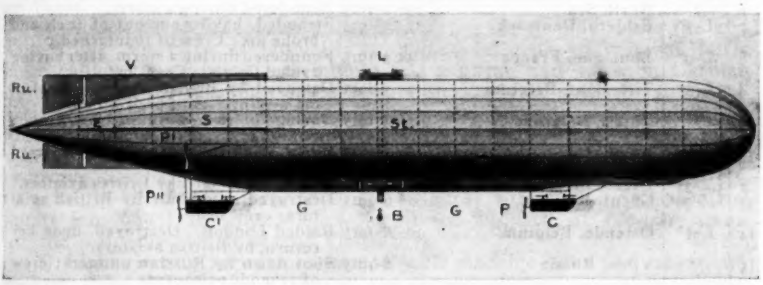
The Hull.—The hull of the ante-bellum Zeppelins was in the shape of a cylinder with two symmetric ogival ends—a very poor form, aerodynamically speaking; and it was still made worse by an exaggerated aspect ratio of ten to one, which comes to say that the hull was ten diameters long.

On the super-Zeppelin this defect has been remedied to some extent. The bow is slightly blunter than before, while the stern is nearly conical; furthermore the aspect ratio has been somewhat decreased, so that now the hull is only about eight or nine diameters long. Although this ratio is still some way off the one disclosed by aerodynamic research work to effect the smoothest air-flow (6:1), it must materially assist the super-Zeppelin in attaining a greater speed without the expenditure of additional power.

Regarding the size of super-Zeppelins, an examination of the wreck of the *LZ-77* reveals that this vessel (which undoubtedly belong to a recent type, as is disclosed by her factory number) was about 540 feet long, with a displacement of over 1,100,000 cubic feet which would furnish a lift of about 33 tons.

The Steering Organs.—The steering organs have been greatly simplified on the super-Zeppelin.

A picture of the *L-15* (which was photographed before she broke up and sank) shows clearly, that in place of a large number of small and parallel



OUTLINE (SIDE VIEW) OF A 30-TON SUPER-ZEPPELIN. DRAWN TO DATA OBTAINED FROM THE WRECKS OF "LZ-77" AND "L-15"

(*CC'*) engine cars (the one in front containing the pilot house); (*PP'P''*) propellers; (*G*) gangway connecting the cars and containing water-ballast and fuel tanks; (*St*) stairway leading from bomb-room (*B*) to armed lookout (*L*); (*S*) stabilizing fin; (*E*) elevator; (*V*) vertical fin; (*Ru*) rudders.

rudders and elevators, there is now a compact *empennage*, very similar to that of a tractor aeroplane. Both rudder and elevator now consist of simple "flaps" which are hinged to the vertical and horizontal fins, respectively. Their surface area has naturally increased, as the conical stern takes up less space than when it was blunt; as a consequence, and, owing also to a smoother air-flow, the efficiency of the steering organs should have materially increased.

The Propelling Apparatus.—The distribution of power has been radically redesigned on the super-Zeppelin, the new system being one that follows marine practice closer than was customary hitherto.

While the 1914-15 type of naval Zeppelin was propelled by two sets of two 200-horse-power engines, each set driving two air-screws mounted on outriggers on either side of the hull, the super-Zeppelin carries but one engine in the front car and three engines in the rear car. Two of the stern engines drive side propellers in the old fashion; but the third one, as well as the front engine each drive a directly coupled propeller at the rear of the cars.

The advantages derived from mounting the propellers astern are manifold. Firstly, as there is nothing to interfere with the air thrown back by the propellers, the efficiency of the latter should be somewhat increased; secondly, the danger of sparks from the enhaust, which might ignite the hydrogen, is rendered very remote; and thirdly, the mounting of the engines in the stern car should afford more room in the front car for the navigating personnel.

TABLE SHOWING PROBABLE ZEPPELIN LOSSES FROM AUGUST 1, 1914, TO MAY 3, 1916

No.	Name	Place	Date	Cause of Loss
1	Z-8*	Badonvillers, France	22- 8-1914	Destroyed by French gunners. Part of crew lost.
2	Z-5*	Mlava, Russia	29- 8-1914	Destroyed by Russian gunners. Crew lost.
3	?*	Seradz, Russia	6- 9-1914	Captured, while at anchor, by a cavalry patrol. Crew of 30, prisoners.
4	?	Düsseldorf, Germany	9-10-1914	Destroyed in shed by British aviators.
5	LZ-31*	Friedrichshafen, Germany	21-11-1914	Destroyed in shed by British aviators.
6	?	North Sea	23- 1-1915	Foundered during a storm.
7	L-3*	Esbjerg, Denmark	17- 2-1915	Stranded, having run out of fuel, and broke up. Crew of 16 interned.
8	L-9*	Boulogne, France	5- 3-1915	Foundered during a storm, after having raided Calais. Crew lost.
9	L-8*	Tirlemont, Belgium	4- 3-1915	Damaged by British aviator; wrecked on landing. 21 of crew killed.
10	?	Thielt, Belgium	12- 4-1915	Damaged, over Béthune, by French gunners; wrecked on landing.
11	?*	North Sea	26- 5-1915	Broke away without crew; foundered off Heligoland.
12	LZ-37*	Evere, Belgium	7- 6-1915	Destroyed in shed by British aviators.
13	LZ-38*	Ghent, Belgium	7- 6-1915	Destroyed in mid-air by British aviators; crew lost.
14	L-?*	Ostende, Belgium	10- 8-1915	Raided London. Destroyed, upon her return, by British aviators.
15	?*	Vilna, Russia	24- 8-1915	Shot down by Russian gunners; crew of 10 made prisoners.
16	?*	Saint-Hubert, Belgium	13-10-1915	Destroyed by exploding in mid-air.
17	?	Maubeuge, France	16-10-1915	Stranded on a chimney and broke up.
18	?	Grodno, Russia	5-11-1915	Destroyed by the storm on landing.
19	L-18*	Tondern, Germany	17-11-1915	Wrecked in shed through an accidental (?) explosion.
20	Z-28	Hamburg, Germany	17-11-1915	Wrecked by the storm.
21	L-22*	Tondern, Germany	1-12-1916	Destroyed in shed through accidental explosion of a bomb.
22	?*	Kalkun, Russia	5-12-1916	Shot down by Russian gunners. Crew lost.
23	?*	Mainvault, Belgium	30- 1-1916	Raided Paris. Damaged by French aviator; wrecked on landing.
24	L-19*	North Sea	21- 2-1916	Raided England. Probably run out of fuel; foundered. Crew lost.
25	LZ-77*	Révigny, France	21- 2-1916	Shot down by French motor guns; destroyed in fall. Crew of 15 killed.
26	L-15*	Kentish Knock, England	1- 4-1916	Shot down by British gunners; crew of 18 surrendered. Vessel sank.
27	L-20*	Stavanger, Norway	3- 5-1916	Raided Scotland. Stranded, having run out of fuel and drifted with the wind. Blown up by crew; 3 killed, 16 interned.

* Destruction authenticated.

One might therefore assume that ultimately the stern car will become the sole engine room, while the bow car will be the navigating room and nothing else. If this has not been done yet, it should rather be attributed to a lack of higher powered engines, than to some obscure reason for keeping one propeller ahead.

Armament.—The armament of these vessels has hardly changed. The bomb-room has remained in the middle of the gangway; but the crude way of dropping bombs by hand has been superseded by a scientific appliance, whereby the bombs are released electrically.

In addition to the two machine guns mounted on each car, two more have been provided for arming the lookout post, atop of the hull, which is connected with the bomb-room by means of a stairway encased in a chimney.—*Scientific American*, 13/5.

ANTI-ZEPPELIN DEFENCES.—The dirigible *LZ-77* was hit while flying at a height of between 1800 and 2000 meters. The airship which visited Paris came at about the same altitude, but immediately after rose to more than 3000 meters by throwing out its ballast and bombs, and climbing with its inclined planes. The airman J. de Lesseps, who chased it for more than 50 minutes, just beneath it, without losing sight of it, but unable to hit it, told me he calculated he was from 700 to 800 meters lower than the Zeppelin. His own barometer indicated a height of 2800 meters, the maximum his gun-plane could reach. It would seem, then, that the best plan, from every point of view, would be to attack the Zeppelins before their arrival over the city, and before they have dropped their projectiles. Above the cities themselves it is better to leave the defence to the anti-Zeppelin guns. Light aeroplanes, climbing high and quickly, can alone attack the monster on his return journey, high up in the air. This gives three phases to the battle:

(1) Attack by gun-planes before the arrival of the Zeppelin over London or Paris.

(2) Attack by anti-Zeppelin guns, fired from the ground while the airship is over the city. If possible, use should be made of guns of fairly large caliber, quick-firing, resembling the 104-mm. and 120-mm. German naval guns, firing at a high angle with three kinds of shells: "spotting" shell, leaving a luminous track, to discover the Zeppelin and regulate the fire; shattering shell; and shrapnel shell, bursting into innumerable fragments. The 104-mm. anti-aircraft Krupp gun, 45 calibers long, sends a projectile weighing 15½ kilograms, with a muzzle velocity of 800 meters, to a height of 4000 meters, and fires 15 shots a minute. The shrapnel bursts into 625 fragments. These, with the addition of 120-mm. guns, are the ordnance which defend Ostend.

(3) Light-chasing aeroplanes, armed with machine-guns and incendiary rockets, should attack the airship on the return journey, at a high altitude.

It is equally indispensable to have a very large number of exceedingly powerful searchlights, placed in a circle round the point to be defended, their rays inter-crossing like an X, so as to catch the Zeppelin as if between the blades of a pair of scissors. It would also be useful to have a certain number of searchlights mounted on aeroplanes, so as to carry the rays nearer the Zeppelin.

If the bulk of a Zeppelin seems to make it an easy target, its speed and its ability to rise rapidly make it difficult to discover, to approach, and to bring down. It is a difficult task.

Zeppelins certainly arrive over England at a low altitude, and perhaps even at reduced speed, so as to economize petrol while at sea. They gradually rise, as the weight of petrol diminishes, but they may, on occasions, have been obliged to throw out ballast on reaching the coast line.

Germany has to-day about 40 Zeppelins, the greater number of which are destined for patrol service over the North Sea and the Baltic, in constant communication with her fleet and her submarines. They thus police the seas and keep a watch on ships of commerce. That is the principal task of Zeppelins.—*London Times*, 25/3.

An aerial ambulance, it is reported, is being built by a California manufacturer, and army aviators at San Diego, Cal., have been permitted to see it. Under the body of the aeroplane is slung a small cot, which is so fastened and constructed that it will be impossible for the occupant to fall out or even to be shaken when the aeroplane volplanes to earth. It is understood that while the craft is en route to the hospital a trained attendant will be enabled to give first aid to the patient.—*Scientific American*, 29/4.

FIFTEEN-TON FLYING BOATS FOR BRITISH ADMIRALTY.—The British Admiralty has ordered 20 triplanes similar to the 15-ton Curtiss flying yacht which is now being completed at a plant near Buffalo, according to a recent statement of Henry Woodhouse, governor of the Aero Club of America. The spread of the planes of these machines will be 133 feet, and the propulsion will be supplied by four 12-cylinder, 250 horse-power motors. An auxiliary motor will be provided to drive a screw propeller, so that the craft can be navigated at slow speeds on the surface of the water.—*Scientific American*, 29/4.

"ZEPPELIN FLEET" MADE IN ENGLAND.—That England is building airships of the Zeppelin type was disclosed in the House of Commons to-day by Thomas James Macnamara, Financial Secretary of the Admiralty, in reply to the question of a member.

Mr. Macnamara said it was not in the public interest to say how many such aircraft Great Britain possessed.—*N. Y. Herald*, 9/5.

EXPANSION OF ROYAL NAVAL AIR SERVICE.—The striking expansion of the Royal Naval Air Service in the twelve months from December, 1914, to December, 1915, is shown in the following comparison, the details being taken from the Navy Lists of January, 1915, and January, 1916:

	Dec., 1914	Dec., 1915
Wing Captains	1	3
Wing Commanders	7	13
Squadron Commanders	19	33
Flight Commanders	30	61
Flight Lieutenants	59	107
Flight Sub-Lieutenants	114	574
Warrant Officers	32	104
	262	895

—*United Service Magazine.*

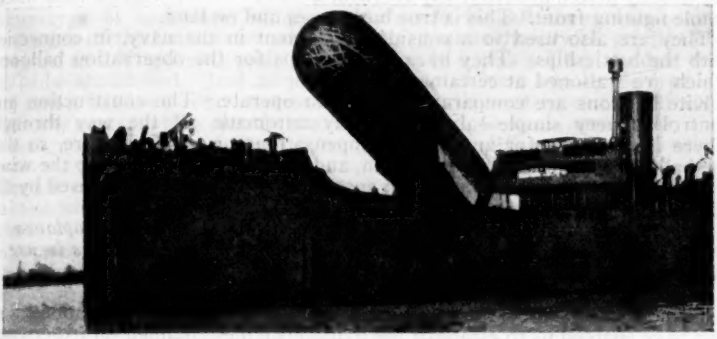
The causes of British casualties among aviators was a topic of keen discussion in the House of Commons recently. Noel Pemberton-Billing, lately elected on the air preparedness issue, stated that a series of casualties with a total of 150 dead, 150 wounded and 105 missing was due to the sending of British aviators to the front in aeroplanes which were outclassed hopelessly by German machines. Harold J. Tennant, Parliamentary Secretary of the War Office, made conciliatory answers to these charges and assured Mr. Pemberton-Billing that he was wholly misinformed, although admitting that at present a majority of German machines were probably faster than the bulk of the British machines. He added, however, that the disadvantage was only a temporary one, and the near future would witness the British aviators on superior mounts. —*Scientific American*, 29/4.

GERMAN AVIATIK OF NEW TYPE.—A new type of Aviatik biplane was recently brought down behind the French lines. Its wings, which no longer sweep back as in the earlier types, measure 41 feet in span, with a chord of 6.4 feet. The structure is of oval steel tubing throughout. The engine is a 170 horse-power Mercedes driving a Garuda tractor. The weight, empty, works out at 1600 pounds, and the useful load, including armament, amounts to approximately 1300 pounds. The machine is exceptionally fast and has a climbing speed of 4000 to 4500 feet in 15 minutes.—*Scientific American*, 29/4.

HUNDREDS OF KITE BALLOONS IN THE EUROPEAN WAR. *By Ralph H. Upson.*—One of the surprises during my visit to Europe was to find that kite balloons are used so extensively—almost everywhere, and for a number of purposes.

The Germans developed the kite balloon first, some 15 years ago. Since that time it has been used quite largely in Germany, but had not been taken up in other countries until the recent war.

France had put faith in spherical captive balloons, but practically none are now used. The kite balloon is immensely superior. It combines the



KITE BALLOON RISING OUT OF THE MOTHER-SHIP

DIRECTING THE FIRING OF ALLIES' SHIPS THAT SHELL THE ENEMY'S COAST FORTIFICATIONS AT ZEEBRUGGE

principles of the kite and the balloon. Of course, on a very calm day the spherical balloon can be used, but on windy days there can be used only the kite balloon, or a series of kites with enough surface to lift a man, and the logical compromise is to combine both in one.

The kite balloon operates under practically any weather conditions that are likely to be met, up to a 30-mile wind. That is an unusually stiff gale,

and occurs on very few days of the year, and even then the balloons can be sent up, but then the ballon is apt to plunge.

Kite balloons are used primarily for spotting artillery fire, and, in general, for any observation that can be made from a point about three miles behind the lines. The general purpose is to keep a watch of the front, and they are usually placed at sufficiently frequent intervals to command a view of the whole fighting front. This is true both at sea and on land.

They are also used to a considerable extent in the navy, in connection with the battleships. They have special ships for the observation balloons, which are stationed at certain points.

Kite balloons are comparatively easy to operate. The construction and control is very simple—almost entirely automatic all the way through. There is provision for automatic compensation for wind pressure, so that the balloon will not buckle or cave in, and it is kept ahead on into the wind.

It is estimated that not less than 1000 kite balloons are being used by the Allies.

The army and navy of the United States have only a few aeroplanes, so it is hardly surprising to find that there are not any kite balloons in use.—*Flying*, May.

THE NEWEST AEROPLANES. *By M. Georges Prade.*—Twenty months of war have enabled us to establish for flying doctrines founded on experience. The present article concerns itself specially with aeroplanes in relation to their various modes of employment in modern warfare. Three general ideas emerge from the facts, and may serve to guide us in this study:

1. As military operations develop we find more numerous uses for the aeroplane.

2. At one time, with a view of simplification, the unification of types was thought of. It now appears, on the contrary, that in order to get the best results it is important to specialize different types of aeroplanes for different uses.

3. Finally, technical rules of construction are being established day by day which show that, below a certain power of motor and certain dimensions of apparatus, as well as above a certain power of motor and certain dimesions of apparatus, there is no aeroplane of practical use. Let us examine these three ideas.

Variety of Employment.—As the operations at present in progress develop it is seen that the aeroplane is suitable for all kinds of work. With fixed fronts, transforming the two armies in presence into real siege armies, whose services behind the lines are stationary, and with no limit to the development of material, this multiplication of the uses of the aeroplane becomes really prodigious. It is from the air that artillery fire is regulated, after the airmen have reconnoitered and photographed the enemy's positions, taken the plan of their trenches, and discovered the importance and the emplacement of their batteries. It is from the air that the arrival of reinforcements by rail or motor car is signalled. By means of aerial bombardments attempts are made to cut, or at least disorganize, the enemy's communications. These attempts are made even on the base railway stations, and, further still, on the factories and powder magazines whence come the munitions. During the battle the aeroplane flies above the troops and regulates the lengthening of the fire as the assaulting forces advance. In addition it is necessary to secure the mastery of the air by preventing the adversary from doing the same as ourselves in the air, and protecting our own machines from the enemy. As fighting machines we have the chasing aeroplane and the counter-chaser, which attack and defend the working aeroplanes and the captive balloons which watch and act as police day and night over towns and principal centers of production, protecting them from enemy aeroplanes and dirigibles.

It may be said to-day that flying is the most complicated arm, and the most infinite in its applications, as it combines in itself the doctrines, the needs and the resources of all the arms which fight on land. Add to this its

utilization at sea, and you will have some idea of the diversity of the necessary uses of the aeroplane in warfare. I insist on this word necessary, for the aeroplane gives to those who know how to make use of it such a superiority that none of its resources can be neglected, and every possible application soon becomes an indispensable application.

Four Principal Classes.—Constructors first thought of building an almost unique type of aeroplane, which would serve for all these uses. The advantages of this unification were obvious; greater facility of production, of repair, and of apprenticeship. Unfortunately it was a Utopian idea, and had to be abandoned. Just as it is impossible to have one single type of ship, and it has been found necessary to create different types for different functions, necessitating specific qualities of speed, tonnage, armament, and defence, so it has been found necessary to create different types of aeroplanes.

Certain of the functions which I have just enumerated demand, in fact, qualities which not only differ, but are opposed to each other, and practically exclude one another. Thus, the ideal apparatus for regulating artillery fire would be one capable of perfect immobility above the points to be observed. A "chaser," on the contrary, calls for the greatest possible speed. Now, in aviation, the lowest speed without falling is always in relation to the greatest speed—it is roughly equivalent to 50 per cent of the maximum speed. The incompatibility of these two solutions is apparent. In the same way, a "bomb-dropper" must above all be a weight lifter, a quality entailing considerable wing surface, and consequently low speed and a certain difficulty in maneuvering.

On the other hand, it was impossible to increase to infinity the types of machines, because we have neither an infinity of models nor of motors, and the qualities of an aeroplane are first of all determined by the power and weight of its motor. A compromise was therefore arrived at by the selection of four principal types of aeroplanes, which are, according to their uses —(1) scouting aeroplanes; (2) artillery observation aeroplanes ;(3) bomb-droppers; (4) battleplanes. Each of these types is divided into sub-types, ranging from what may be called the minimum of utilization to the maximum of utilization.

Scouts.—They are employed for the examination of the enemy sector, first by the eye of the observer, and afterwards by means of photography. At the beginning of the war these aeroplanes were obliged to have a large sphere of action. With trench warfare this range of action has been much reduced. It is therefore not necessary for them to carry much petrol. Their principal qualities are: great maneuvering facility, in order to escape from enemy artillery fire, and great climbing power, to escape from enemy chasers, for, considering the essential irregularity of their missions, it is almost impossible to supply them with convoys of fighting planes to protect them. They should have on board a camera with special lens, a machine gun able to fire in all directions for self-protection, and, finally, a wireless installation, specially useful in signaling the advance of troops during important battles. The scouting aeroplane is the least specialized of all machines. It is the machine which requires the greatest number of average qualities and especially great facilities for starting from and landing on all kinds of ground. Biplanes of about 43 feet spread of wing, with motors of from 80 to 150 horse-power, are employed in this work.

Artillery Direction.—The ideal instrument for directing artillery fire would be a kite which could be sent up and brought down at will, and would remain motionless above the enemy target. The apparatus must be able to fly slowly and permit the observer to look in all directions, for it is not a question of taking photographs. The observer must be able to tell where every shell falls, and by wireless immediately regulate the fire of the battery. At the same time he must escape the enemy's artillery fire and the attacks of chasers—attacks rendered all the easier by the fact that the artillery observation plane does not leave its sector, and the enemy knows where to find it. The apparatus should therefore be light, small, able to climb rapidly,

a good aircraft in all winds, with an observer enjoying the utmost freedom. Consequently use should be made of small biplanes with a wing spread of about 30 feet, furnished with two light and powerful rotary motors. The observation seat might be slightly protected, but it is needless to over-arm the apparatus. The artillery officer has no time to see whether he is about to be attacked. He passes slowly and continuously over the target he is surveying. One the other hand, as his itinerary is fixed, nothing is easier than to protect him by means of a chaser, turning above him and dominating in advance the adversary bent on attacking him.

Bomb-Droppers.—The bomb-dropper is the dreadnought of the air. At the same time one must not be misled by the apparent ease of indefinitely increasing its size. There comes a moment when the degree of usefulness decreases in proportion to the increase in power. This is where a halt must be called. It is better to distribute the same weight of bombs over a greater number of machines, for by so doing we obtain greater security, augment the accuracy and rapidity of the domb-dropping, and add to the chances of escape from the enemy. The bomb-dropping aeroplane must include among its qualities a certain minimum of speed, climing power, and maneuvering capacity to enable it to escape from the fire of anti-air guns. As for chasers, bomb-droppers must not be expected to defend themselves against these. They must be escorted by squadrons which have nothing else to do, composed of machines in which the weight carried does not consist of bombs, but of guns and munitions. Bombarding fleets always include several squadrons, operating on well-determined itineraries, known in advance, at fixed hours. Thus, convoying them is easy. It has been found possible to group in this way 50 machines, which, flying in a triangle like wild duck, have gone as far as the large cities of South Germany—Stuttgart, Karlsruhe and Mannheim.

These machines must therefore have very powerful motors—200 horse-power—a large range of action, and large fuselage, permitting the well-aimed dropping of bombs of special apparatus. They should also carry a machine gun. This is the most difficult machine to construct, and the task of he who pilots it is both ungrateful and perilous—long raids over enemy territory.

The Battle-Plane.—This is the latest product of military aviation, and it is easy to understand why. In aerial warfare one first of all attempts to make use of one's own aeroplanes. After that one tries to prevent the enemy from doing the same. This gave rise to the creation of the "chaser," a light aeroplane, rapid, and climbing very quickly, so as to dominate the adversary—a favorable position in aerial combat. Finally came counter-chasers, whose object is to defend working aeroplanes—that is scouting planes, artillery directing planes, and bomb-droppers—against enemy chasers. These aeroplanes are of the same type as chasers, simply rendered more redoubtable by their armament.

Aeroplanes of the fighting type cannot be large, a condition which limits their artillery and its caliber. Most of them do not exceed a ton in weight. They are the only single-seated type. The pilot is at the same time the gunner. A two-seated apparatus would be preferable. The smaller the machine the better provided it can carry a sufficient armament and is built in such a way as to permit firing in every direction.

There are two schools: those who are in favor of placing the propeller in front, which augments the speed, but does not allow the use of the forward machine gun; and those of the propeller in the rear, which means a slower machine, but more accurate firing. The first school has triumphed, for it is easier to improve the firing than to do without great speed, which alone makes chasing possible. The necessity of making warfare on balloons, Drachen ("sausages") and Zeppelins has led to the creation of gun-planes, and for fighting Zeppelins at night less rapid machines have been built. They land in the dark with less danger. Armed scouting machines are used for this purpose. The questions of aeroplane armament and of aeroplanes intended for night flights merit special study.

Limit of Dimensions.—It only remains to draw the logical conclusion on the subject of the size of aeroplanes. The largest aeroplane and the most powerful is the bomb-dropper. The smallest is the chaser. The practical limits of construction, minima and maxima, will therefore be obtained from the two following considerations drawn from their two special applications: An aeroplane is too small when it does not even permit a machine gun to be carried; an aeroplane becomes too large when its increase in power and surface is not accompanied by a proportionate increase in weight-lifting capacity.

The materials employed in construction are not capable of indefinite improvement. There comes a moment in a large apparatus when they are no longer capable of supporting the pressure and resistance consequent on the increased mass. At this critical moment one of two things happens. On the one hand there may be either a reduction in the factor of safety—which is in general six; that is to say, each part of the aeroplane ought to be able to support during the static test six time the normal pressure in regular flight. Then the apparatus becomes dangerous. On the other hand the structure may be modified and strengthened, when the apparatus becomes heavier, that is to say, it carries less useful weight. Besides, it is impossible to pilot it, for it is too heavy and does not answer the rudder.

This is why no giant apparatus exists made from available materials. It is only the operation of a natural law; giant animals are gradually disappearing. Motor cars have never exceeded a certain weight. Aeroplanes will never, practically, go beyond certain dimensions so long as they depend on the same laws of flight, with motors of the same weight, in proportion to their power.—*London Times*, 7/4.

LESSONS OF THE WAR

WARSHIP DESIGN AND THE PRESENT WAR.—So far as the naval aspect of the present war is concerned, the experience of such fighting as has already taken place has been sufficient thoroughly to justify the design of the vessels forming the British fleet at the time of the outbreak of war. So far, only the battle cruisers have seen fleet actions, and only two of these. The one off the Falkland Islands was fought against a much weaker force, though that off the Dogger Bank certainly provided some more interesting information, as the opposing forces were more evenly matched. In the former case the German 8-inch guns were opposed to the British 12-inch; in the latter the German 11-inch and 12-inch guns were opposed by the British 12-inch and 13.5-inch weapons. That is, in both cases the Germans were out-gunned. All theoretical consideration of the size of gun to be adopted and of the armor required to minimise the effect of the enemy's projectiles must necessarily be based on an estimate of the decisive battle range at which it is anticipated that actions will be fought. In the event of lack of actual experience, that of target practice under conditions expected to resemble those of actual warfare as closely as possible must be taken as forming the best possible guide. At the battle off the Falkland Islands, the British battle cruisers were hit by the 8-inch German shells of the *Scharnhorst* at a little under 10,000 yards, and our ships did much of the damage to the Germans at about 12,000. The official dispatch of the action off the Dogger Bank, contained the remarkable statement that "we commenced hitting at 17,000 yards."

Mr. Owen pointed out that the primary weapons should be of the smallest caliber and weight necessary to carry an efficient bursting charge through the maximum thickness of protecting armor of an enemy's ship at the range of maximum vision. Now, in the Dogger Bank fight it is said that German belt armor-plates were carried bodily inboard without being perforated, and that at a range previously regarded as impracticable. Armor will not keep out heavy shell. Its value lies really in the fact

that in order to perforate it, a less dangerous projectile must be used than would be the case if the armor were either thinner or absent. At ranges such as those at which the Dogger Bank action was fought the heavier gun was amply justified, and under the circumstances it may confidently be stated that an even heavier weapon than the 13.5-inch would have given correspondingly better results. Even with its great accuracy and flat trajectory the 50-caliber 12-inch gun is too small at 12,000 yards when used against vessels of the *Derfflinger* type. The chances of hitting, and, if hitting, of doing far greater damage, are enormously increased with the larger size weapons now mounted. In this connection it is interesting to note the recent references in the daily press to the German 17-inch weapon, with which, it has been suggested, some of the German battleships may have been re-armed. Nothing is more improbable.

As regards the disposition of main armament, and the concomitant problem of number of heavy guns, we may regard each of the battle cruiser actions as corroborating both Sir William White's and Mr. Owen's views as to the desirability of limiting the number of heavy guns to eight. Nothing occurred in either action that went to prove that triple turrets possessed the slightest advantage nor did anything disprove their anticipated defects. Both actions—and this was realized both by pursuers and pursued—corroborated the value of center-line and superposed turrets, and to this extent, as was prophesied by Sir Philip Watts in the course of the discussion on Mr. Owen's paper, showed that the partly advocated adoption of a flush-decked vessel, with all four turrets at approximately the same height above the waterline, would obviously have been a mistake. The advantage of ample ahead and astern fire has been thoroughly proved.

Nothing has yet occurred in the course of the war to affect seriously the views previously held on the subject of the auxiliary armament of battleships. If anything, the utility of the 4-inch weapon as an anti-torpedo weapon has been thoroughly vindicated, although it has mainly been used against submarines. That it should be placed high up instead of on the main deck is also certain.

The extensive use of mines and torpedoes in the present war has caused the keenest attention to be paid to questions of under-water protection and internal subdivision. However thoroughly these features of warship design had been investigated before the war, recent experience has shown that adequate defence against the modern large size torpedo or mine is very difficult to provide, except at the expense of other qualities too valuable to sacrifice, and, further, that the proper defence should lie less in the ship itself than in the extended use of auxiliaries acting in concert. Internal protection in the form of additional longitudinal bulkheads running parallel to the sides has always been a feature of recent German naval designs, but such protection is impossible in small craft, and in their case unfortunately damage by mine or torpedo must be accepted as fatal. Even in a big ship it is almost impossible to guarantee safety, and for some time to come the below-water vulnerability of capital ships must be regarded as a particularly weak point.

Of the two salient qualities of British warship design referred to above—those of habitability and seaworthiness—it may be remarked that in the course of the war the proofs of their excellence and necessity have cast most interesting lights on many foreign designs, and particularly on those of the German Navy. Nearly every recent German ship of any size has been over-gunned, and hence has had to carry an unduly large crew, with the result that in many of their newer ships, especially the battleships of the *Nassau, Helgoland* and *Kaiser* classes, overcrowding of the crew has been a notorious defect. This applies even more to their torpedo craft, of which surprising little has been heard during the present war. In harbor this is of little consequence, but the radical change of ventilating conditions on proceeding to sea is bound to make itself felt to a considerable extent.

So far, we have not touched on the question of machinery design, as

affected by war experience, but all that has gone to corroborate the soundness of the admiralty policy in warship design as a whole has been, if possible, even more emphatic where the propelling machinery of the ships has been concerned. The whole-hearted adoption of oil fuel alone has been of inestimable advantage. Perhaps the most remarkable feature of the performances of all the ships has been the almost universal reliability of engines and boilers, and particularly those of the destroyer flotillas, for the newer battleships have had hardly enough sea-keeping to tax their strength seriously. There are instances of vessels of the former type having steamed distances without undergoing elaborate overhaul that appear almost incredible. Much of this, of course, is due to the adoption of the steam turbine; perhaps even more is due to the care lavished on the machinery by the engine-room staffs.—*The Engineer*, 4/2.

QUADRUPLE GUN TURRET SATISFACTORY.—The criticisms and comments to which the *Tourville* type is anew giving rise in America are attracting some attention here. United States experts, whilst being aware that the days of the mastodon are not over, have been brought by the lessons of the present war to the view that the policy of placing too many eggs in one basket is less than ever to be recommended, and that the 32,000-ton *California* type marks a limit in battleship displacement which it would be highly unwise to transgress, though, in the opinion of some, there might be room for huge mastodons of low speed, mounting monster guns, and so completely and thickly armored as to be invulnerable both to artillery and to mine and torpedo. Therefore, the important question is what amount of power, offensive and defensive, can be piled up in some 30,000 tons? Hence the profuse comparisons of late in American service journals between the latest types of super-dreadnoughts. The *Queen Elizabeth* is, of course, much admired as a masterpiece of engineering and ballistic skill, but she has too few guns (eight) for United States experts, who agree with the Paris Admiralty in staking their faith in a combination of the advantages of penetration at long range and volume of fire. So the 29,000-ton *Tourville* design, with its 16 guns in quadruple turrets, against 12 for the *California*, is the type most discussed, and doubt has been expressed as to the practical value of quadruple turrets and the wisdom of placing so many weapons in one gunhouse at the mercy of a lucky shot or of an accident. Similar criticisms has also been formulated on this side, but since the *Normandies* have assumed a completed shape and conclusive tests have been made, the quadruple turret, which is made of the coupling of two separate (armored bulkhead) and independent twin turrets, is unanimously acknowledged to have answered all expectations in the matter of rate of fire and of the possibilities of simultaneous firing and of rapid concentration of guns on a target. No other system permits of so great a command and arc of fire for the heavy guns, of so great a measure of invulnerability to shock and to projectiles, together with so substantial a saving in the displacement and total cost. Relatively to her armament, the *Tourville* is up to date the most economical design. Such at least is the contention of her many partisans.—*Naval and Military Record*, 26/1.

THREE-GUN TURRET CRITICIZED.—There is a difference of expert naval view concerning the installation on the battleships to be authorized at this session of Congress of the three-gun turret, which has been a feature of recently designed vessels of that type. The naval general board has been lately making a thorough study of all the conditions that apply to turrets and has come to the conclusion that the three-gun turret should be abandoned and that there should be a return to the two-gun turret. The former represents the familiar defects of "too many eggs in one basket," as the principal reason, since the disability of one such turret places three guns out of commission as compared with two guns under the other conditions. In the tentative design of the next battleships to be authorized

at this session, therefore, it is proposed that there shall be five turrets, each carrying two guns of 16-inch caliber, that caliber representing a radical increase in gun power, another point at issue which has been determined by the general board in favor of the larger size as compared with the present 14-inch gun or the prospective 15-inch gun. It has been decided that 10 of the 16-inch guns will produce better results than 12 of the 14-inch guns, and that if there is to be an increase of caliber it should be with the idea of surpassing the heaviest guns in the armament of foreign navies. The general board contemplates no increase of speed in the new battleships. —*Shipping Illustrated*, 11/3.

EXPERT CONTROL NEEDED.—The utter dependence of the whole Allied cause on the supremacy of the British Navy is gradually dawning on the lay mind, and with this realization of the incalculable issues at stake comes an insistent demand that seamen shall be placed in undivided control of naval policy. The government's obstinacy on this point can only be explained by the numbing influence of political tradition. It is certain that the appointment of a capable and distinguished sea officer as First Lord would be hailed with intense relief and satisfaction not only throughout the Empire, but in every Allied country. Yet a step so simple, practical, and altogether desirable is delayed, apparently for the sole reason that it would be contrary to precedent and political tradition.—*Naval and Military Record*, 2/2.

FLOTILLA LEADERS AND BIG-GUN SCOUTS.—The new British flotilla leaders, which we are told are now playing an important rôle in the North Sea flotilla, belong to a type that has many partisans. Prominent naval men, including Admiral de Lapeyrère, have long recommended the construction of "contretorpilleurs divisionnaires" of 1400-1800 tons, intended to fill a gap between the scout and the destroyer, and in certain respects better fitted for the duties of mother-ships than much larger vessels of 4000 tons or more, too deep in the water to accompany the flotillas everywhere, and too vulnerable to torpedo and mine. Considerations of this order caused the displacement of our projected éclaireurs to be brought down from 6000 to 4500 tons. And the latter tonnage has been criticized as being much too large for "conducteurs d'escadrilles," the official designation given to the scouts added on paper to our navy list. It was reserved to the British Navy to embody the valuable experience derived both from the *Swift* and her recent improved destroyers into robust and fast flotilla leaders of the smallest displacement (and consequently lowest cost) compatible with the services expected of them. The lead of the British Navy in this respect will no doubt be followed by other Admiralties.

The multiplication of flotilla leaders—half destroyers, half scouts—will also be helped by the tendency, manifested in the U. S. program, to give some battle value and big guns to anything having the name of cruiser. Our numerous armored cruisers, carrying nothing above the 7.6-inch caliber (92 kilos shells), Admiral Bienaimé decided, many years since, as being a foolish waste of expenditure, and he asked that, just like the frigates of old, cruisers should mount battleship calibers in guns, reduced in number, of course, so as to be able to have a say in any action. The thing is not impracticable when are remembered the 4000-ton Japanese Bertin cruisers with their 12-inch gun.—*Naval and Military Record*, 26/1.

ARGUMENT FOR UNITY IN CALIBER FOR DESTROYERS.—The *Lika* and *Triglav*, destroyed off the coast of Albania, and their four sister ships and in general design and armament copies of the *Boucliers*, carrying, like the latter, two guns of 4-inch bore, together with four 12-pounders (9 pounders in the French). The advantages claimed in favor of this mixed battery are a greater volume of fire, and especially a stronger end-on fire than is possible, for instance, with an armament of three weapons of 4-inch as in recent

British destroyers. And the advantage of training three guns ahead instead of one is of obvious importance when torpedo-boat chasing or submarine hunting. Such, at least, things appear to be on paper, but in practice our naval men, who have had some war experience with the 1000-ton *Intrepides* (built for the Argentine Republic and requistioned), which carry four guns of 4-inch and with our excellent *Chasseurs*, armed with six 9-pounders, have come round to the British view that the better utilization of fire and greater accuracy resulting from unity in the caliber of artillery are assets of primary military value.—*Naval and Military Record*, 26/1.

THE "UNSINKABLE" BATTLESHIP.—The successful use of the torpedo by the submarine in the present European War has led Mario Monticelli, major of naval engineers, of Italy, to make a study of a new type of "unsinkable battleship," which is described in the February issue of the *Rivista Marittima* (*Maritime Review*) of Rome. Major Monticelli has used, as the basis for the plan of his proposed new type of battleship, the armored cruiser *San Giorgio*, of the Italian Navy. He points out the fact that of the many warships that have been torpedoed by submarines not a few of them have remained afloat and have reached port. This has suggested to the Italian engineer the idea of creating a type of ship especially built to resist the torpedo's blows not only by additional armor protection, but also by a form of construction that would save the vessel from sinking in case of a stroke.

Speed is the first requisite for a warship's protection against a torpedo from a submarine, Major Monticelli declares, and his plans for his new type of vessel call for engines powerful enough to drive her 30 Italian miles an hour. To attain this he is willing to lessen the number and power of the guns, although not to such an extent as to materially impair the fighting qualities of the ship. The chief departure in this new type, however, is not to be found in these elements. It lies in the building of a hull within the hull and of enclosing this with an inner as well as an outer sheathing conforming to the general lines of the vessel.

The five plates reproduced with the article show the motive and fighting powers of the unsinkable battleship enclosed within a "stout box" of steel, as the writer calls it, the sheer plan of which shows a form not unlike the early types of submarines. Within this are engines, boilers, coal bunkers, revolving turrets, conning-tower and wheelhouse; in a word, the whole offensive and defensive powers of the vessel. This "nucleus," as the writer prefers to call it, is surrounded by the conventional hull of an armored cruiser, in which the "nucleus" is a separate entity so far as form and structure are concerned, only connected with the hull proper by frames designed to yield before the blow of a torpedo. For the whole intent of this design of Monticelli's is that it must be prepared to "give" a little before such a stroke.

Between the hull of the vessel proper and the "nucleus" is an intermediate plating forming two armored hulls to be penetrated before the blow of the torpedo could reach the extreme inner hull. According to Monticelli's plans these three series of platings would be divided by frames into watertight compartments. He lays great stress on the need of building such a ship with the idea of its structure yielding to shock of a torpedo's explosion. It is figured that although by successive leaks all the external spaces of the ship should be flooded, the driving power safe within the inner hull would prevent the ship from sinking. And that even if one of the compartments in the "nucleus" itself were penetrated by the torpedo's explosion, there would still be enough flotation power in the inner hull to make the new type live up to its name of unsinkable. Since, as Major Monticelli says, the battle between the submarine and its torpedo and the armored ship has now assumed the same character as that between big guns and armor plate, the type of war vessel he has evolved in his design may carry the floating warship one step further forward in its defence against its undersea enemy. —*Army and Navy Journal*, 13/5.

CANALS

PANAMA CANAL REOPENED.—The Panama Canal was reopened to traffic April 15 with the passage of 16 ships, seven northbound and nine southbound, including the army transport *Buford*. The channel through the cut was in excellent condition and the passage of the vessels was without incident. The first vessel to use the reopened waterway was the British steamship *St. Veronica.—Shipping Illustrated*, 22/4.

PANAMA WHARVES AND DOCKS BEING RUSHED.—Construction work on the Pacific Terminal of the Panama Canal, which includes a 1000-foot drydock, a coaling plant, new wharves and piers, has been delayed, due to non-delivery of material from the United States. The working force has been greatly increased and it is hoped to have the drydock and the entrance basin in shape early this month so that it will be possible to break the cofferdam and allow water to come against the dock. Work on the unloader and reloader wharves for the Balboa coaling plant is being pushed. A great deal of difficulty has been experienced in placing the foundations of these wharves as it has been necessary to use the utmost care in blasting and excavating the rock in this vicinity.—*Marine Journal*, 22/4.

MARSEILLES-RHONE CANAL.—The Marseilles-Rhone Canal, a great engineering work that has been under way for some time, is now nearly completed. The four and a half mile tunnel through which the canal will flow, penetrating the Rove Mountains, is on the point of completion. The work was begun six years ago and the war has not been permitted to interfere with the enterprise. The width of the canal through the tunnel is 72 feet and the depth of the water 15 feet 11 inches, permitting small Mediterranean steamships to enter the Rhone and even admitting sea traffic to go as far up the river as Lyons. The canal, which is just short of 50 miles in length, cost about $18,000,000, of which $7,000,000 was borne by the French Government and the remainder by the city of Marseilles and the Department of the Bouches-du-Rhone.—*Shipping Illustrated*, 11/3.

RADIO

MARCONI WIRELESS IMPROVEMENTS.—It is reported that Senatore Marconi has been carrying out some important experiments and tests in Italy with far-reaching results, which directly concern the future practice of the entire science of wireless telegraphy and telephony. It is stated that he is now engaged in making applications for the patents, which will probably be applied at once in Italy to military purposes. By these means results heretofore impossible will be obtained.—*The Engineer*, 7/4.

NAVY MOBILIZES COMMUNICATIONS.—With 53,000 miles of telephone wire and 600 specially trained employees of the American Telephone and Telegraph Company pressed into service, the U. S. Navy mobilized the country's means of communication between 4 p. m. on May 6 and 6 a. m. on May 8. Communication was established by telephones of the American Telephone and Telegraph Company between 16 of the government's naval stations on the four borders of the country and the Navy Department and also by wireless telephone of the same company with the battleship *New Hampshire*.

By means of this mobilization Secretary Daniels talked from his desk in the Navy Department in Washington with nearly every navy yard in the country, gave formal orders by telephone to all of them, found bulletins coming in from Brooklyn and elsewhere over the writing telegraph and

then by means of the wireless got into communication with the United States ships at sea as far away as Honolulu, 4900 miles on one side or the coast of Europe on the other.

Direction of the movements of navy vessels at sea by wireless telephone became an accomplished fact when Secretary Daniels gave verbal instructions to the battleship *New Hampshire*, lying in Hampton Roads. The instructions were to proceed to sea not later than 10 o'clock next morning and to report position hourly by wireless telephone to the Navy Department until noon Monday, then to anchor off the mouth of the Potomac River and make a full report of cruise by wireless telephone to the Naval Academy at Annapolis.

The telephone people in co-operation with the Navy Department have been working on the scheme for more than a year. With Captain W. H. G. Bullard, U. S. N., Chief of the Bureau of Communications, in charge for the navy, and John J. Carty, chief engineer of the telephone company, and his aids, the system was worked out. The system is divided into four general groups, telephone, telegraph, wireless telephone and printer telegraph.

Not a hitch occurred during the demonstration. Secretary Daniels, Admiral Benson, Chief of Operations, and other navy officers were enthusiastic over the success of the communication, and the Secretary sent the following telegram to Theodore N. Vail, president of the American Telephone and Telegraph Company: "I congratulate you and all of the forces of your company on the splendid success of the mobilization of the forces of communication in co-operation with the United States Navy."—*Army and Navy Journal*, 13/5.

REVIEW OF WIRELESS TELEGRAPHY.—The United States Bureau of Navigation has issued a monograph entitled "Important Events of Radiotelegraphy" which gives, besides the history of the wireless telegraph itself, the important steps in electrical development which led logically to the invention of this means of communication. There are special chapters on "Some Recent Developments," "Radio Inspection Service," and "Wireless as a Safeguard to Life at Sea." There are 14 pages of events by dates. Copies of the publication may be obtained from the Superintendent of Documents, Government Printing Office, Washington, D. C., at five cents each.—*Scientific American*, 13/5.

PROPOSED WIRELESS STATIONS FOR SPAIN.—According to information recently published in the official organ of the Seville Chamber of Commerce, a company has been organized with a view to operating wireless telephone systems in the different cities of Spain and to connect with the Spanish vessels and Spanish colonies in Africa. The proposal contemplates the erection of stations in the cities of Cordoba, Seville, Cadiz, and Huelva, and 29 other stations in other parts of Spain, in the Canary Islands, and at Tangier, Melilla, Ceuta, and Ibiza, in Africa. The first-class stations are to be 5 kw. and the second of 2 kw. rating.—*Scientific American*, 13/5.

A DETECTOR BASED ON NEW PRINCIPLE.—There has recently been perfected a crystal detector the operation of which is based on an entirely new principle. Instead of the crystal coming in contact at one point only with a sharpened metal rod or fine wire, as is usually the case, the surface of the crystal makes contact with the minute particles of a finely divided alloy. Thus there are almost innumerable contacts in the detector, which is made in the form of a small insulated disk with a knurled edge for adjustment purposes. To adjust the detector, it is only necessary to turn the disk slowly while listening to the varying strength of the signals in the telephone receivers.—*Scientific American*, 13/5.

MISCELLANEOUS

ATLANTIC AND PACIFIC AMERICA'S BEST FRIENDS.—A despatch from Washington dated April 28 states: "Nearly one-half of all the gold the United States owns is stored in Denver vaults. Heretofore the New York Treasury vaults have held the bulk of the bullion with San Francisco as the next largest repository. Accumulation of the nation's gold at Denver, according to Treasury officials, has been going on for some weeks. They admitted the recent critical international situation might have had something to do with it. There was $438,473,286 in gold at Denver on April 1st, more has been added."

We commend this item of news to your careful attention. Distance rather than men to protect the Treasury Department recalls the minstrel joke of who are America's two best friends? The Atlantic and Pacific Oceans! !—*Extracted from Serial No. 49, dated May 5, 1916, of letters written by Hubbard Bros. & Co.*

HOUSE COMMITTEE ON THE MERCHANT MARINE ON THE GOVERNMENT SHIPPING BILLS (H. R. 10500 AND 14337).—Our informant states that the bills will be and emerge from the committee about as follows:

A shipping board is created to be composed of the Secretary of the Navy and the Secretary of Commerce, as members ex-officio, and five commissioners to be selected and appointed by the President, who shall be selected with due regard to their fitness and to a fair representation of the geographical divisions of the country. Not more than three commissioners shall be of the same political party, no commissioner shall be in the employ of or hold any official relation to any common carrier subject to the provisions of the Act, nor be engaged actively in any other business or employment. The salaries of the commissioners are to be $10,000 per annum.

The board is authorized to have constructed in American yards and navy yards or elsewhere (giving preference, other things being equal, to domestic yards) or to purchase, lease, or charter, vessels suitable, as far as the commercial requirements of the marine trade of the U. S. may permit, for use as naval auxiliaries or army transports, or for other naval or military purposes.

The President is permitted to transfer to the board vessels not in use by the army and navy, and also vessels of the Panama Railroad Co., not required for its business.

The board may charter, lease, or sell to any person, a citizen of the U. S., any vessel so purchased, constructed, or transferred. When vessels belonging to the board become unfit for use they may be sold at public or private sale free from the conditions and restrictions of this Act. Provision is made for taking over vessels in time of war or national emergency in the usual manner by appraisal.

The board is authorized to form one or more corporations for the purchase, construction, equipment, lease, charter, maintenance and operation of merchant vessels in the commerce of the United States. Total capital stock not to exceed $50,000,000.

The bill will contain a provision to the effect that at the expiration of five years from the conclusion of the present European War the operation of vessels on the part of any corporation organized by the board shall cease and the said corporation stand dissolved. The vessels and other property shall revert to the board, and it may sell, lease, or charter such vessels and deposit proceeds in treasury to its credit. Stock of such dissolved corporations to be taken over by board at a fair and reasonable value.

The Shipping Board is charged with the duty of investigating the relative cost of building vessels in the U. S. and in foreign maritime countries, as well as the relative cost and disadvantages in operation. It is to study the navigation laws and regulations thereunder and make recommendations

to Congress for the amendment, improvement and revision of such laws and for the development of the merchant marine. It is to investigate the legal status of mortgage loans on vessel property, with a view to means of improving the security of such loans and of encouraging investment in American shipping.—*Shipping Illustrated*, 6/5.

WARSHIPS OF THE FIRST LINE OF BATTLE.* *By Colonel E. Ferretti, R. I. N., M. I. N. A.*—From the beginning of the dreadnought battleship era there has been evident a marked tendency to re-arrange and to reduce the number of types of genuine ships of war, resulting in the re-grouping of them into the following four classes:

(a) Ships of the line.
(b) Cruisers.
(c) Scouts.
(d) Destroyers and submarines.

It is only proposed to discuss here the different stages of development in the design of a modern battleship, and to outline a type which will represent a battleship of the future.

Gun Armament.—In warships of the line of the last decade, the caliber of the principal gun armament has continuously increased from, approximately, 11.8-inch to 15.75-inch; while the gradual and continuous improvement of the arm has brought successive increase of length in relation to caliber, increase in initial velocity and weight of projectile, increase in weight of charge, in range and perforation, improvement in fire control, greater rapidity and security in loading, increase in length of life of gun, etc. The factor governing armament development may be summed up in the statement that in practice the maximum destructive effect is always found with a gun of the maximum caliber and longest range.

With the increase in caliber there has gone hand in hand an increase in the number of guns in each emplacement and in each ship. In the more recent units there are examples of emplacements with two, three, and four guns, while the number of emplacements varies from three to seven for guns of the same caliber and on the same ship. With a caliber of about 13.28-inch, 12 guns per ship have been installed, and 16 may be predicted in the near future; while with a caliber of about 15-inch the number of guns per ship up to the present time is about eight, with a clear tendency toward increase. By consensus of opinion the emplacements of the heaviest guns are all located along the central fore and aft line of the ship.

The secondary gun armament of the modern ship of the line has followed a development approximately similar to that of the principal armament. The gun armament, principal and secondary, has been, in all navies and in recent times, supplemented with a large number of light guns with high-angle fire and with disappearing mounts.

Armor.—The development of armor for battleships of the line has followed, during the past 10 years, along lines closely similar to those for gun armament, of which it is the immediate and inevitable consequence. It may be stated that since the days of the original dreadnought the following principles have been accepted by leading naval designers regarding the criteria of defensive armament:

(a) Prolongation of the belt armor to the entire length of the ship, save at the stern where certain navies omit all protection in the vertical plane.

(b) Depth of armor carried to about 8.2 feet below the load water-line, thus reaching somewhat below the lower limit at the outboard edge of the protective under-water deck.

(c) Extension of the side armor, with few exceptions, to the citadel containing the second battery, and a greater height of armor belt forward in comparison with that aft.

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*Abstract of paper read at the International Engineering Congress, San Francisco, U. S. A.; Sept., 1915.

(d) Thickness of armor maintained constant for a considerable fraction of the protected area, in order to secure, with the co-operation of transverse bulkheads armored against raking fire, the defence of all those parts of the ship which may rationally be considered as vital.

(e) Maximum thickness of vertical armor increased gradually from 9.84-inch to 13.78-inch, and in some ships even increased to 17.7-inch for the frontal plates of the turrets for the heavy guns.

(f) Minimum thickness of the vertical armor not reduced below 5.9-inch.

(g) Continuously increasing importance attributed to the value of horizontal defence, and to the necessity of efficient protection for the various decks, and in particular the upper decks.

(h) The most carefully designed protection in order to secure as nearly as possible the absolute invulnerability of the conning tower.

Many questions of a general character relating to the armor protection of ships still remain undetermined, but the various great fighting units of the leading navies have shown a distribution of defensive armor ever more complete and effective, by way of increase of thickness or extent of armored surface. In all, and in absolute value, however, this has proved to be insufficient to counterbalance effectively the enormous growth during the same time in the power and number of heavy guns.

Under-water Defence.—In the last decade, notwithstanding the indications of recent naval battles, in which under-water dangers from mines and torpedoes have shown themselves to be of the greatest significance, designers have not reached any practical conclusion in regard to the best means of opposing such serious menaces to the integrity of the floating structure. The principal cause of the lack of development of adequate means for the under-water defence of warships is the deficiency of information as to the effects of under-water explosions in proximity to obstacles of an extremely complex nature. An effort has been made in certain navies in recent years, however, to give a practical direction to the search for more effective means for the protection of the hull from under-water attack, but there is no certain information regarding practical measures actually adopted, other than the following:

(a) Use of the well-known chain net as formerly used against torpedo attack, in more or less modified form, but which obviously can only render effective service when the ship is at rest or moving at the very lowest speed.

(b) A certain development of means for counter-mining, either applied to the ship itself or independent and operated from special boats.

(c) The disposition of one or more longitudinal internal bulkheads at a certain distance from the outer skin, more or less reinforced or rendered elastic by means of special arrangements, and intended to present an obstacle to the destructive effect of the explosion.

(d) The filling of the internal volume of the ship outboard with coal or other like solid material, intended to limit the quantity of water which can enter as a result of the rupture of the outer skin and to absorb and dissipate part of the energy of the mass of gas, liquid, and splinters driven violently by the force of the explosion toward the interior of the ship.

(e) The disposition (not followed in all cases) of a third internal skin in the wake of the most important points in the hold, or in some cases of a watertight flat situated at a certain height above the central double bottom.

(f) The multiplication of watertight transverse bulkheads, in order to reduce to a minimum the number and size of the compartments susceptible to being flooded in consequence of the explosion of a mine or a torpedo.

(g) The provision of special structures in order to provide for the free escape of the engendered gases which may make their way toward the interior of the ship in consequence of the explosion.

Speed.—The speed of the battleships of the line, since the general adoption of turbine prime movers and water-tube boilers, has ranged around

21 or 22 knots until more recent times, when, as a result of the initiative of certain important navies, an effort has been made to develop a new type of warship capable of uniting all the leading characteristics of ships of the line and of cruisers. In a few years the similarity between these two types was developed in an increasingly marked degree, until the cruiser type finally began to exceed in displacement the ships of the line, with the chief purpose of a notable difference from the latter in the matter of speed. In the brief period of six years the displacement of the battle cruisers of a certain first-rate power rose from 18,000 to 28,000 tons, the caliber of the principal guns passed from 12-inch to 13.5-inch, the thickness of the armor from 7-inch to 10.6-inch, and the speed from 25 to above 30 knots.

The realization of the concept of a high-speed battleship, reuniting in itself the principal requirements of a ship of the line and of a cruiser, was reached, for example, in the British *Queen Elizabeth* and the German *Ersatz Worth*. The latter has a displacement of about 28,000 tons, 15-inch caliber for the eight guns of the main battery, 12-inch and upwards for the maximum thickness of armor, and a designed speed of about 28 knots. It is undeniable that such ships as the *Queen Elizabeth* and *Ersatz Worth* lack but little in the possession of all the fundamental characteristics of true and proper battleships, with high speed and the strategic qualities necessary to enable them to serve as cruisers, and with the necessary tactical characteristics to enable them to sustain the shock of the most powerful adversary. It would only require, perhaps, a further increment in their displacement and in the thickness of their armor to make of them fighting units of the highest efficiency that has yet been realized.

Probable Lines of Future Development.—In proceeding to outline a type which will represent a battleship of the future, and in order that the fighting characteristics may be adjusted in such a manner as to render the ship under design, with equality of displacement, superior in a fighting sense to any other now in existence, it is necessary to accept the following fundamental principles:

(1) Suppression of everything not absolutely required for purposes of naval warfare or for life on shipboard.

(2) Reduction and simplification to the maximum degree of all auxiliary services.

(3) Reduction to the minimum area of the target offered by the above-water body.

(4) Adequate protection of the vital parts in the greatest sense of the word.

(5) Definite separation between the grouping of compartments necessarily hot and those to be maintained at a low temperature.

(6) Maximum arc of gun fire.

The type of vessel suggested would offer more efficient protection against gun fire than existing types, and the proportional reduction in "target area" would be about 25 per cent less than that of the ordinary battleship. Such a vessel would be protected from the attack of 15.75-inch guns with armor of a maximum and minimum thickness of about 12 inches and six inches respectively, such armor to cover the whole area along the water-line, both above and below, as well as that of most of the above-water body, of the base of the single funnel, and of the transverse bulkheads for protection against raking fire. For the protection of the principal guns the armor plates would probably be of a still greater thickness.

This type of vessel would have a displacement of 32,000 tons, with a speed of about 26 knots, which could be raised to 27 or 28 knots in case of necessity. In providing for protection against torpedo attack the outer skin of the hull would be fitted with separate layers of special steel, immediately below the lower margin of the armor plating to well under the bilge, and in fact nearly to the center keel plate. The vessel under consideration would have an inner and an outer skin and would be constructed on the Isherwood system of longitudinal framing, with such

scantlings as to ensure exceptional stiffness and strength. The transverse watertight bulkheads, reinforced in such a manner as to constitute a solid support for the longitudinal members, would be spaced at intervals of from about 10 feet to 23 feet. The outer skin of the hull would be doubled throughout the zone of the double bottom from the lower margin of the armor plating nearly to the keel. The sides of the ship would be divergent above water, even in the central part of the vessel. The structure of the double bottom would be absolutely independent of that of the outer skin, and the double bottom itself would be very high and roomy, with the inner skin of extra strength and doubled in certain zones like the outer skin. The bottom may be divided into three distinct parts:—A central part (in the zone not in danger from under-water explosions) kept normally dry and empty; an intermediate part (wherein some danger from under-water explosion may exist) constantly kept filled with water or liquid fuel; and a lateral part (wherein is found the greatest danger from under-water explosion) always kept filled with coal in the wake of the motive power equipment, and with any suitable material for the remainder.

Two reinforced decks, to replace the usual form of protective deck, would be provided, the upper deck being continuous from stem to stern, while the lower deck would be interrupted in the wake of the propelling machinery. In order that the ship might provide the minimum target, it would be necessary that in all the central zone, comprising the emplacements of the heavy and intermediate guns, *i. e.*, for about 300 feet, the ship should be of limited height above the water, so that the freeboard would only be about nine feet above normal load line.

An important provision of the design would be that effecting adequate sub-division. Six longitudinal bulkheads are suggested, one pair to be fitted on each side of the ship, at about 16 feet from the inner skin, and one pair on the center-line. Either bulkhead constituting each pair would be constructed independently, with an intervening space of about three feet between them. The interior of the ship would be thus divided into four separate zones, of which the two innermost would constitute the part of the vessel most securely protected against under-water attack. In these zones would be placed the propelling machinery, the shells, and all the equipment which it is so vital should be protected in case of attack. Strong and closely-spaced watertight transverse bulkheads would subdivide all the compartments of the ship, while provision would be made for the rapid upward passage of the products of an explosion which might penetrate into the interior of the vessel.

Superstructures would be provided at a suitable height above the water for the heavy guns fore and aft, with heights respectively of 23 feet and 19½ feet above the load-line, but wherever possible other superstructures would be eliminated. The main armament suggested would consist of 10 15-inch 45-caliber guns, arranged in two groups in the fore and after parts of the vessel. The five guns of each group would be arranged in one turret, two above the remaining three, with two planes of fire, in such a way as to give at each end of the ship a single emplacement with an arc of fire throughout 320 degrees. The secondary armament would consist of twelve 7.5-inch 50-caliber guns, arranged in four groups of three guns each, two towards the bow and stern respectively, with a line of fire lying outboard of the heavy gun position. Eight 21-inch torpedo tubes would be fitted, and the remaining armament would include eighteen 4-inch 50-caliber guns of the disappearing type for high-angle fire.

The design provides for propelling machinery consisting of four sets of turbines, completely independent of each other, each driving a screw propeller. The boilers would be all grouped forward in the machinery space, and arranged in such a manner as to facilitate the escape of smoke, etc., through a single funnel. Ten of the boilers would be arranged for burning oil fuel, and 10 for either coal or oil. Coal-bunker space with a capacity of 1500 tons would be provided, and there would also be provision for the storage of 1000 tons of fuel oil.—*The Shipbuilder.*

AN "OPEN DOOR" NOT SUFFICIENT.—A trade condition almost unbelievable is reported from Hong Kong, where every warehouse is jammed full of goods awaiting shipment to the United States. Due to the extreme scarcity of tonnage in the Oriental trade, practically no ordinary merchandise originating in China is being forwarded to America. Freight rates have been quadrupled within a month and the situation is serious in the extreme. Any Congressman who can put two and two together ought to be able to figure out that an "open door" in China means very little to the United States unless there are ships under the American flag with which to carry on trade between these two countries under all circumstances.—*Marine Journal*, 8/4.

MERCANTILE VESSELS LAUNCHED IN THE UNITED KINGDOM AND ABROAD DURING 1915

Where Built	Steam		Sail		Total	
	No.	Tons (Gross)	No.	Tons (Gross)	No.	Tons (Gross)
United Kingdom.....	317	648,629	10	2,290	327	650,919
Other Countries.....	313	518,948	103	31,771	416	550,719
Total for the World..	630	1,167,577	113	34,061	743	1,201,638

—*The Shipbuilder.*

TUG "POCAHONTAS" LAUNCHED AT THE NORFOLK NAVY YARD.—The *Pocahontas* is a modern seagoing tug built at the Navy Yard, Norfolk, Va. The launch was unusual for the reason that the vessel was built on the sea wall, where no permanent ways were possible, and from which she was launched sidewise on temporary ways extending over the sea wall. These ways were designed to tip and drop the vessel off the ends.—*Marine Engineering*, May.

OPTICAL APPARATUS IN WAR.—The outbreak of hostilities caught us short in suitable optical instruments as in all other munitions of war. The great variety of the calls made on the optician by the conditions of modern warfare were well illustrated in a paper read before the Society of Arts on Wednesday evening last, by Mr. C. R. Darling, A. R. C. SC. I. Almost the only representative of the optical instruments used by military men 100 years ago is the telescope, though, we believe, the binocular form was then unknown. This pattern has, as is well known, received some remarkable improvements within the past few years. The older Galilean form is, however, still in use. Mr. Darling states that its magnifying power is from three to five, whilst the field of view ranges from 3° up to 4° 30′. A prismatic binocular, on the other hand, magnifying six to eight times, has a field of view of from 4½° up to 8½°, the advantage of which is obvious. The main merit of its older rival is the relative brilliancy of the image. The greater magnifying power and wider field of view are not, however, the only advantages of the prismatic type. Being essentially the same in principle as the astronomical telescope, it can be fitted, like the latter, with the equivalent of a micrometer screen, which is placed in the focus in the eye-piece, and is clearly seen at the same time as the distance view. One form of screen described by Mr. Darling under the name of graticule consists of a number of lines ruled on a glass plate. These lines are spaced out to represent minutes of arc right or left of the line of sight, or equivalent deflections above or below it. These graticules, he states, are of much assistance in determining accurately the position of an object in the field

of view, and for estimating its size if the distance be known. In a special form, known as the Zeiss stereo-telescope, the prismatic binocular has hinged tubes, and by opening out these the stereoscopic effect can be increased. One pattern in common use for artillery observing purposes has a magnifying power of 10 diameters, a field of view of 4°, and has one eyepiece fitted with a graticule, as described. In still another form, known as the "stereo-telemeter," there is a transparent plate in the focus of the eyepiece of each tube of the binocular. Each plate has engraved on it a series of arrows, which are seen in stereoscopic relief over the landscape viewed, appearing to be at different distances from the eye. The arrows are marked from 90 to 3000 meters, and provided the operator's eyes are alike and his sight keen, the error in the distances estimated will, it is stated, not exceed 1 per cent at 1000 yards, and 4 per cent at 5000 yards. The Barr & Stroud instrument, which was also referred to by Mr. Darling, has already been described in detail in *Engineering*. In the international competition held in America a few years ago it proved infinitely superior to the German instruments. No doubt the latter have since been improved. One pattern, 44¼ inches long and weighing 13½ pounds, will, Mr. Darling states, enable ranges of 5000 yards to be determined within 2½ per cent, and approximate estimates be made of distances as great as 20,000 yards.

Telescopic gun-sights, he states, have generally a magnification of from 3 to 35 diameters. In some patterns, notably the Ross, this magnification can be varied from 5 to 20 diameters without altering the focus of the instrument. The change is effected by a single movement. The advantage of this arrangement is that the low power and correspondingly large field can be used to find the object, and the higher power is then brought into use to get better definition. The great advantage of telescopic sights is that the fiducial mark and the object aimed at are in focus simultaneously. Searchlights also make severe demands on the skill of the optician. At one time the mirrors were of glass, but they are now always of metal, the reflecting surface being silver or gold, or occasionally palladium or nickel. The mirrors used for lighting up a large area at a short range are, Mr. Darling states, parabolic in vertical section and elliptic in horizontal section. A lateral dispersion of as much as 45° can thus be obtained with a vertical dispersion of a few degrees only. Another plan of attaining the same end is to place cylindrical lenses in the path of the beam. By adjusting the distance between these lenses any desired lateral dispersion can be obtained. This plan is favored by the navy, as with it one focus of reflector can be used for all purposes. The largest reflectors are about 4 feet in diameter, and the smallest 14 inches. For the small lamps, taking 20 amperes, the carbons are 18 mm. and 12 mm., respectively; whilst with the large lamps, taking 150 amperes, the carbons measure 38 mm. and 26.5 mm. The management of these lamps requires, Mr. Darling said, considerable skill, but the need has been met by students from our technical colleges.—*Engineering*, 10/3.

ELECTRICALLY OPERATED TYPEWRITER.—There has recently been placed on the market a typewriter of standard design which is equipped with special machanism so that form letters may be written automatically from a perforated paper record or master sheet. The paper records are perforated on another machine provided with a standard keyboard. The automatic typewriter is operated by a 1-20th horse-power electric motor, and if desired the auxiliary mechanism can be disengaged and the typewriter used in the usual way. Thus it is possible to fill in the name and address of the person for whom the letter is intended and then start the paper record mechanism running for the balance of the letter. Further, the mechanism can be shut off at any point and a special sentence or paragraph inserted. Obviously, the work produced by this machine is identical with that produced on the conventional typewriter, hence is accorded the same attention by the recipient as would a personal letter. The new machine is said to write at the rate of 130 words per minute.—*Scientific American*, 6/5.

CURRENT NAVAL AND PROFESSIONAL PAPERS

NOTE.—Lack of space limits the scope of these references. Upon application, members of the Institute will be supplied with fuller references to current periodicals published in both the United States and foreign countries.

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1. SCIENTIFIC AMERICAN. **March 18.**—Calculations for Ships' Forms, by *Rear Admiral D. W. Taylor.* The World's Largest Electric Kitchen. **March 25.**—On the Trail of Villa. What is Done for the Wounded. A German Gas Turbine. **April 1.**—High Explosive Shells. Navy Consulting Board's Committee on Industrial Preparedness, I. **April 8.**—The Extreme Ranges of Modern Guns, by *Major Alston Hamilton.* **April 15.**—Engineering in the Navy, by *W. L. R. Emmet.* Rapid-fire "Revolver" Principle Applied to Submarine Torpedo Tube. Large Naval and Coast Defence Guns, by *G. H. Holden.* Detonation of Submarine Mines by Electricity. **April 22.**—Scientific Bomb Dropping. Industrial Development of Japan. **April 29.**—Mexico: Government, Resources, Military Strength. **May 6.**—The Bagdad Railway and the European War. Our Nautical Schoolships. **May 13.**—The Motor Patrol Squadron. Trend of Aeronautics toward Giant Aircraft. War Game, IX. A Survivor's Impressions of the *Sussex* Disaster. The Future of Ship Propulsion.

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5. FLYING. **April.**—Bill to Establish Independent Department of Aeronautics. Scouting Flights and Defence of Isolated Naval Bases, by *Major H. C. Davis.*

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8. ENGINEERING MAGAZINE. **April.**—The Importance of Leadership, by *H. L. Gantt.* Labor and Industry after the War, by *F. C. Howe.* Germany's Industrial Efficiency, by *C. E. Knoeppel.* **May.**—Industrial Lessons from Germany, by *C. E. Knoeppel.*

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THE SINKING OF THE GERMAN ZEPPELIN "L-15," WHICH WAS BROUGHT DOWN BY BRITISH AIR BATTERIES OFF THE KENTISH COAST. IT WENT TO THE BOTTOM A FEW MINUTES AFTER HAVING BEEN TAKEN IN TOW BY BRITISH HARBOR BOATS
(Photo by International Film Service)

EUROPEAN WAR NOTES

Compiled by LIEUTENANT C. C. GILL, U. S. Navy

GENERAL ARRANGEMENT

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DIPLOMATIC NOTES

(Prepared by A. F. WESTCOTT, PH. D., Instructor, U. S. Naval Academy)

UNITED STATES AND GERMANY

On **April 10** Germany sent to the United States the following note giving details of submarine attacks on the *Sussex* and other merchant vessels:

BERLIN, April 12.

The undersigned has the honor to inform your Excellency, Ambassador Gerard, in response to communications of the 29th and 30th ultimo and the 3d instant regarding the steamers *Sussex, Manchester Engineer, Englishman, Berwindvale* and *Eagle Point* that the mentioned cases, in accordance with our notes of the 30th and 31st ultimo and the 4th and 5th instant, have been subjected to careful investigation by the admiral staff of the navy, which has led to be following results:

First.—The English Steamer Berwindvale.—A steamer, which was possibly the *Berwindvale,* was encountered on the evening of March 16 in sight of the Bull Rock Light, on the Irish coast, by a German submarine. The steamer, as soon as she noticed the submarine, which was running unsubmerged, turned and steamed away. She was ordered to halt by a warning shot. She paid no attention, however, to this warning, but extinguished all lights and attempted to escape. The vessel was then fired upon until halted, and without further orders lowered several boats. After the crew entered the boats and received enough time to row away the ship was sunk.

The name of this steamer was not established; it cannot be stated with assurance, even with the help of the details which were furnished by the American Embassy, that the above described incident concerns the steamer *Berwindvale.* Since, however, the steamer sunk was a tank steamer like the *Berwindvale,* the identity of the ships may be assumed. In this case, however, the statement made that the *Berwindvale* was torpedoed without warning would conflict with the fact.

Second.—The British Steamer Englishman.—This steamer on March 24 was called upon to halt by a German submarine, through two warning shots, about 20 sea miles west of Islay (Hebrides). The vessel proceeded, however, without heeding the warning, and was therefore forced by the submarine by artillery fire to halt after an extended chase, whereupon she lowered boats without further orders.

After the German commandant had convinced himself that the crew had taken to the boats and rowed from the ship, he sank the steamer.

Third.—The British Steamer Manchester Engineer.—It is impossible to establish through the investigation up to the present whether the attack on this steamer, which, according to the given description, occurred on March 27, in the latitude of Waterford, is attributable to a German submarine. The statement regarding the time and place of the incident gives no sufficient basis for investigation. It would therefore be desirable to have more exact statements of the place, time and attendant circumstances of the attack reported by the American Government in order that the investigation might thereupon be brought to a conclusion.

Fourth.—The British Steamer Eagle Point.—This steamer in the forenoon of March 28 was called upon to halt by a German submarine through signal and shot about 100—not 130—sea miles from the southwest coast of Ireland, but proceeded. She was thereupon fired upon until halted, and, without further orders, lowered two boats, in which the crew took their places. After the commandant convinced himself that the boats, which had hoisted sails, had gotten clear of the steamer, he sank the steamer.

At the time of the sinking a north-northwest wind of the strength of two, not "a storm wind," and a light swell, not "a heavy sea," as stated in the given description, prevailed. The boats, therefore, had every prospect of being picked up very quickly because the place of the sinking lay on a much-used steamer path.

If the crew of the steamer used only two small boats for saving themselves the responsibility falls upon themselves, since there were still upon the steamer, as the submarine could establish, at least four big collapsible boats.

Fifth.—The French Steamer Sussex.—Ascertainment of the fact whether the channel steamer *Sussex* was damaged by a German submarine was rendered extremely difficult because no exact details of time, place, and attendant circumstances of the sinking were known, and also because it was impossible to obtain a picture of the ship before April 6. Consequently the investigation had to be extended to all actions undertaken on the day in question—March 24—in the channel in the general region between Folkestone and Dieppe.

"In that region, on March 24, a long, black craft without a flag, having a gray funnel, small gray forward works and two high masts, was encountered about the middle of the English Channel by a German submarine. The German commander reached the definite conclusion that it was a war vessel, and, indeed, a mine-layer of the recently built English *Arabic* class. He was led to that conviction by the following facts: First, by the plain, unbroken deck of the ship; second, the form of the stern, sloping downward and backward like a war vessel; third, she was painted like a war vessel; fourth, the high speed developed, about 18 knots; fifth, the circumstance that the vessel did not keep a course northward of the light buoys between Dungeness and Beachy Head, which, according to the frequent and unvarying observations of German submarines, is about the course of commercial vessels, but kept in the middle of the channel, on a course about in the direction of Le Havre.

"Consequently, he attacked the vessel at 3.55 in the afternoon, middle European time, one and one-half sea miles southeast of Bull Rock (Bullock?) Bank, the submarine being submerged. The torpedo struck and caused such a violent explosion in the forward part of the ship that the entire forward part was torn away to the bridge."

The particularly violent explosion warrants the certain conclusion that great amounts of munitions were aboard.

The German commander made a sketch of the vessel attacked by him, two drawings of which are inclosed. The picture of the steamer *Sussex*, two copies of which are also inclosed, is reproduced photographically from the English paper, *The Daily Graphic* of the 27th ultimo.

A comparison of the sketch and the picture shows that the craft attacked is not identical with the *Sussex*. The difference in the position of the stack and shape of the stern is particularly striking.

No other attack whatever by German submarines at the time in question for the *Sussex* upon the route between Folkestone and Dieppe occurred. The German Government must therefore assume that the injury to the *Sussex* is attributable to another cause than an attack by a German submarine.

For an explanation of the case the fact may perhaps be serviceable that no less than 26 English mines were exploded by shots by German naval forces in the channel on the 1st and 2d of April alone. The entire sea in that vicinity is, in fact, endangered by floating mines and by torpedoes that have not sunk. Off the English coast it is further endangered in an increasing degree through German mines which have been laid against enemy naval forces.

Should the American Government have at its disposal further material for a conclusion upon the case of the *Sussex*, the German Government would ask that it be communicated, in order to subject this material also to an investigation.

In the event that differences of opinion should develop hereby between the two governments, the German Government now declares itself ready to have the facts of the case established through mixed commissions of investigation, in accordance with the third title of The Hague agreement, for the peaceful settlement of international conflicts, November 18, 1907.

The undersigned, while requesting that you communicate the above to the government of the United States, takes occasion to renew to the Ambassador the assurance of his distinguished esteem. JAGOW.

The *Sussex*, a British channel steamer, Folkestone to Dieppe, with about 325 passengers, including 25 Americans and 53 crew, was sunk on March 24 at 2.50 p. m. (3.50 mid-European time). According to the report of Admiral Grasset, of the French Navy, the vessel left Folkestone at 1.25 at a speed of 16 knots, and was headed south 3° east from Dungeness, in mid-channel, at the time of the disaster. The captain saw a torpedo on the port beam, some 150 meters away, and ordered the helm hard aport, stopping the starboard engine. Eight seconds later, as the ship was beginning to swing off, a terrific explosion cut the ship in two. On deck several passengers saw the torpedo when quite close to the ship.

THE TORPEDOING OF THE "SUSSEX."—Captain Persius discusses in the *Berliner Tageblatt* the German note to America on the torpedoing of the *Sussex*. He remarks that the explanation given admirably illustrates the extraordinary difficult situation in which German submarine commanders now often find themselves.

It is not easy (he goes on) for a layman to put himself in a corresponding situation, but by pondering the five points which are given as grounds for the belief that the submarine was in the presence of a hostile warship he can form a slight idea of the anxious service of a submarine commander. The question: "Is it, or is it not, a warship?" can often in the darkness of night not be answered with certainty. Naturally the commandant will exercise the utmost care in his scrutiny, and will only give the order to fire a torpedo if quite sure on the point, but the time to make observations is frequently only to be measured by a few seconds. The promptest decision is essential if a hostile warship is not to escape destruc-

tion. It is frequently announced that a vessel has been torpedoed without warning. As again appears from the government note, this news is only in the rarest cases subsequently confirmed. Should it, however, occasionally happen that an innocent ship is damaged, it should be taken into consideration that it is matter of an unfortunate accident, which cannot be avoided in peace, much less in war. It is easy with brow anxiously contracted to pass judgment at a green table on "unjustified torpedoing." Actually it is far more difficult to torpedo a ship at all, and to carry out torpedoing entirely free from objection in the existing difficult circumstances one must be almost a superman.—*London Times*, 15/4.

On **April 20** President Wilson despatched the following note to Germany, requiring that "unless the German Government should now immediately declare and effect an abandonment of its present methods of submarine warfare against passenger and freight carrying vessels, the government of the United States can have no choice but to sever diplomatic relations with the German Empire altogether."

The note is addressed to Ambassador Gerard, at Berlin, and instructs him to "deliver to the Secretary of Foreign Affairs a communication reading as follows":

I did not fail to transmit immediately, by telegraph, to my government your Excellency's note of the 10th instant in regard to certain attacks by German submarines, and particularly in regard to the disastrous explosion which, on March 24 last, wrecked the French steamship *Sussex* in the English Channel. I have now the honor to deliver, under instructions from my government, the following reply to your Excellency:

Information now in the possession of the government of the United States fully establishes the facts in the case of the *Sussex*, and the inferences which my government has drawn from that information it regards as confirmed by the circumstances set forth in your Excellency's note of the 10th instant.

On March 24, 1916, at about 2.50 o'clock in the afternoon, the unarmed steamer *Sussex*, with 325 or more passengers on board, among whom were a number of American citizens, was torpedoed while crossing from Folkestone to Dieppe. The *Sussex* had never been armed; was a vessel known to be habitually used only for the conveyance of passengers across the English Channel, and was not following the route taken by troop ships or supply ships. About 80 of her passengers, non-combatants of all ages and sexes, including citizens of the United States, were killed or injured.

A careful, detailed and scrupulously impartial investigation by naval and military officers of the United States has conclusively established the fact that the *Sussex* was torpedoed without warning or summons to surrender and that the torpedo by which she was struck was of German manufacture. In the view of the government of the United States these facts from the first made the conclusion that the torpedo was fired by a German submarine unavoidable. It now considers that conclusion substantiated by the statements of your Excellency's note. A full statement of the facts upon which the government of the United States has based its conclusion is inclosed.

The government of the United States, after having given careful consideration to the note of the Imperial Government of the 10th of April, regrets to state that the impression made upon it by the statements that the Imperial Government has failed to appreciate the gravity of the situation which has resulted, not alone from the attack on the *Sussex*, but from the whole method and character of submarine warfare as disclosed by the unrestrained practice of the commanders of German undersea craft during

the past 12 months and more in the indiscriminate destruction of merchant vessels of all sorts, nationalities and destinations.

If the sinking of the *Sussex* had been an isolated case, the government of the United States might find it possible to hope that the officer who was responsible for that act had wilfully violated his orders or had been criminally negligent in taking none of the precautions they prescribed, and that the ends of justice might be satisfied by imposing upon him an adequate punishment, coupled with a formal disavowal of the act and payment of a suitable indemnity by the Imperial Government. But, though the attack upon the *Sussex* was manifestly indefensible and caused a loss of life so tragical as to make it stand forth as one of the most terrible examples of the inhumanity of submarine warfare as the commanders of German vessels are conducting it, it unhappily does not stand alone.

On the contrary, the government of the United States is forced by recent events to conclude that it is only one instance, even though one of the most extreme and most distressing instances, of the deliberate method and spirit of indiscriminate destruction of merchant vessels of all sorts, nationalities and destinations which have become more and more unmistakable as the activity of German undersea vessels of war has in recent months been quickened and extended.

The Imperial Government will recall that when, in February, 1915, it announced its intention of treating the waters surrounding Great Britain and Ireland as embraced within the seat of war and of destroying all merchant ships owned by its enemies that might be found within that zone of danger, and warned all vessels, neutral as well as belligerent, to keep out of the waters thus prescribed or to enter them at their peril, the government of the United States earnestly protested. It took the position that such a policy could not be pursued without constant gross and palpable violations of the accepted law of nations, particularly if submarine craft were to be employed as its instruments, inasmuch as the rules prescribed by that law, rules founded on the principles of humanity and established for the protection of the lives of non-combatants at sea, could not in the nature of the case be observed by such vessels. It based its protest on the ground that persons of neutral nationality and vessels of neutral ownership would be exposed to extreme and intolerable risks; and that no right to close any part of the high seas could lawfully be asserted by the Inperial Government in the circumstances then existing. The law of nations in these matters, upon which the government of the United States based that protest, is not of recent origin or founded upon merely arbitrary principles set up by convention. It is based, on the contrary, upon manifest principles of humanity and has long been established with the approval and by the express assent of all civilized nations.

The Imperial Government, notwithstanding, persisted in carrying out the policy announced, expressing the hope that the dangers involved, at any rate to neutral vessels, would be reduced to a minimum by the instructions which it had issued to the commanders of its submarines, and assuring the government of the United States that it would take every possible precaution both to respect the rights of neutrals and to safeguard the lives of non-combatants.

In pursuance of this policy of submarine warfare against the commerce of its adversaries thus announced and thus entered upon in despite of the solemn protest of the government of the United States, the commanders of the Imperial Government's undersea vessels have carried on practices of such ruthless destruction which have made it more and more evident as the months have gone by that the Imperial Government has found it impracticable to put any such restraints upon them as it had hoped and promised to put. Again and again the Imperial Government has given its solemn assurances to the government of the United States that at least passenger ships would not be thus dealt with, and yet it has repeatedly permitted its undersea commanders to disregard those assurances with entire impunity. As recently as February last it gave notice that it would regard

all armed merchantmen owned by its enemies as part of the armed naval forces of its adversaries and deal with them as with men-of-war, thus at least by implication pledging itself to give warning to vessels which were not armed, and to accord security of life to their passengers and crews; but even this limitation their submarine commanders have recklessly ignored.

Vessels of neutral ownership, even vessels of neutral ownership bound from neutral port to neutral port, have been destroyed along with vessels of belligerent ownership in constantly increasing numbers. Sometimes the merchantmen attacked have been warned and summoned to surrender before being fired on or torpedoed; sometimes their passengers and crews have been vouchsafed the poor security of being allowed to take to the ship's boats before the ship was sent to the bottom. But again and again no warning has been given, no escape even to the ship's boats allowed to those on board. Great liners like the *Lusitania* and *Arabic* and mere passenger boats like the *Sussex* have been attacked without a moment's warning, often before they have even become aware that they were in the presence of an armed ship of the enemy, and the lives of the non-combatants, passengers and crew have been destroyed wholesale and in a manner which the government of the United States cannot but regard as wanton and without the slightest color of justification. No limit of any kind has, in fact, been set to their indiscriminate pursuit and destruction of merchantmen of all kinds and nationalities within the waters which the Imperial Government has chosen to designate as lying within the seat of war. The roll of Americans who have lost their lives upon ships thus attacked and destroyed has grown month by month until the ominous toll has mounted into the hundreds.

The government of the United States has been very patient. At every stage of this distressing experience of tragedy after tragedy it has sought to be governed by the most thoughtful consideration of the extraordinary circumstances of an unprecedented war and to be guided by sentiments of very genuine friendship for the people and government of Germany. It has accepted the successive explanations and assurances of the Imperial Government as, of course, given in entire sincerity and good faith and has hoped, even against hope, that it would prove to be possible for the Imperial Government so to order and control the acts of its naval commanders as to square its policy with the recognized principles of humanity as embodied in the law of nations. It has made every allowance for unprecedented conditions and has been willing to wait until the facts became unmistakable and were susceptible of only one interpretation.

It owes it to its just regard for its own rights to say to the Imperial Government that that time has come. It has become painfully evident to it that the position which it took at the very outset is inevitable, namely, the use of submarines for the destruction of an enemy's commerce, is, of necessity, because of the very character of the vessels employed and the very methods of attack which their employment, of course, involves, utterly incompatible with the principles of humanity, the long-established and incontrovertible rights of neutrals and the sacred immunities of non-combatants.

If it is still the purpose of the Imperial Government to prosecute relentless and indiscriminate warfare against vessels of commerce by the use of submarines without regard to what the government of the United States must consider the sacred and indisputable rules of international law and the universally recognized dictates of humanity, the government of the United States is at last forced to the conclusion that there is but one course it can pursue.

Unless the Imperial Government should now immediately declare and effect an abandonment of its present methods of submarine warfare against passenger and freight carrying vessels, the government of the United States can have no choice but to sever diplomatic relations with the German Empire altogether. This action the government of the United States contemplates with the greatest reluctance, but feels constrained to take in behalf of humanity and the rights of neutral nations.

On **April 27** Secretary Lansing issued a memorandum, prepared in March, defining the position of the United States regarding armed merchant vessels in neutral ports and on the high seas. In general, the memorandum states that a neutral government "may proceed on the assumption that an armed merchant vessel of belligerent nationality is armed for aggression," sufficient proof being given by a commission or orders requiring it to conduct aggressive operations, or by evidence that it has carried on such operations. On the other hand, "a belligerent on the high seas should proceed on the presumption that the vessel is armed for protection only."

DEPARTMENT OF STATE, WASHINGTON, March 25, 1916.

I

The status of an armed merchant vessel of a belligerent is to be considered from two points of view: First, from that of a neutral when the vessel enters its port, and second, from that of an enemy when the vessel is on the high seas.

First.—An armed merchant vessel in neutral ports.

(1) It is necessary for a neutral government to determine the status of an armed merchant vessel of belligerent nationality which enters its jurisdiction, in order that the government may protect itself from responsibility for the destruction of life and property by permitting its ports to be used as bases of hostile operations by belligerent warships.

(2) If the vessel carries a commission or orders issued by a belligerent government and directing it under penalty to conduct aggressive operations, or if it is conclusively shown to have conducted such operations, it should be regarded and treated as a warship.

(3) If sufficient evidence is wanting a neutral government, in order to safeguard itself from liability for failure to preserve its neutrality, may reasonably presume from these facts the status of an armed merchant vessel which frequents its waters. There is no settled rule of international law as to the sufficiency of evidence to establish such a presumption. As a result a neutral government must decide for itself the sufficiency of the evidence which it requires to determine the character of the vessel. For the guidance of its port officers and other officials a neutral government may therefore declare a standard of evidence, but such standard may be changed on account of the general conditions of naval warfare or modified on account of the circumstances of a particular case. These changes and modifications may be made at any time during the progress of the war, since the determination of the status of an armed merchant vessel in neutral waters may affect the liability of a neutral government.

Second.—An armed merchant vessel on the high seas.

(1) It is necessary for a belligerent warship to determine the status of an armed merchant vessel of an enemy encountered on the high seas, since the rights of life and property of belligerents and neutrals on board the vessel may be impaired if its status is that of an enemy warship.

(2) The determination of warlike character must rest in no case upon presumption but upon conclusive evidence, because the responsibility for the destruction of life and property depends on the actual facts of the case and cannot be avoided or lessened by a standard of evidence which a belligerent may announce as creating a presumption of hostile character. On the other hand, to safeguard himself from possible liability for un-

warranted destruction of life and property the belligerent should, in the absence of conclusive evidence, act on the presumption that an armed merchantman is of peaceful character.

(3) A presumption based solely on the presence of an armament on a merchant vessel of an enemy is not a sufficient reason for a belligerent to declare it to be a warship and proceed to attack it without regard to the rights of the persons on board. Conclusive evidence of a purpose to use the armament for aggression is essential. Consequently an armament which a neutral government, seeking to perform its neutral duties, may presume to be intended for aggression, might in fact on the high seas be used solely for protection. A neutral government has no opportunity to determine the purpose of an armament on a merchant vessel unless there is evidence in the ship's papers or other proof as to its previous use, so that the government is justified in substituting an arbitrary rule of presumption in arriving at the status of the merchant vessel. On the other hand, a belligerent warship can on the high seas test by actual experience the purpose of an armament on an enemy merchant vessel, and so determine by direct evidence the status of the vessel.

Summary.—The status of an armed merchant vessel as a warship in neutral waters may be determined, in the absence of documentary proof or conclusive evidence of previous aggressive conduct, by presumption derived from all the circumstances of the case.

The status of such vessel as a warship on the high seas must be determined only upon conclusive evidence of aggressive purpose, in the absence of which it is to be presumed that the vessel has a private and peaceable character, and it should be so treated by an enemy warship.

In brief, a neutral government may proceed upon the presumption that an armed merchant vessel of belligerent nationality is armed for aggression, while a belligerent should proceed on the presumption that the vessel is armed for protection. Both of these presumptions may be overcome by evidence—the first by secondary or collateral evidence, since the fact to be established is negative in character; the second by primary and direct evidence, since the fact to be established is positive in character.

II

The character of the evidence upon which the status of an armed merchant vessel of belligerent nationality is to be determined when visiting neutral waters and when traversing the high seas having been stated, it is important to consider the rights and duties of neutrals and belligerents as affected by the status of armed merchant vessels in neutral ports and on the high seas.

First.—The relations of belligerents and neutrals as affected by the status of armed merchant vessels in neutral ports.

(1) It appears to be the established rule of international law that warships of a belligerent may enter neutral ports and accept limited hospitality there upon condition that they leave, as a rule, within 24 hours after their arrival.

(2) Belligerent warships are also entitled to take on fuel once in three months in ports of a neutral country.

(3) As a mode of enforcing these rules, a neutral has the right to cause belligerent warships failing to comply with them, together with their officers and crews, to be interned during the remainder of the war.

(4) Merchantmen of belligerent nationality, armed only for purposes of protection against the enemy, are entitled to enter and leave neutral ports without hindrance in the course of legitimate trade.

(5) Armed merchantmen of belligerent nationality under a commission or orders of their government to use, under penalty, their armament for aggressive purposes, or merchantmen which, without such commission or orders, have used their armaments for aggressive purposes, are not

entitled to the same hospitality in neutral ports as peaceable armed merchantmen.

Second.—The relations of belligerents and neutrals as affected by the status of armed merchant vessels on the high seas.

(1) Innocent neutral property on the high seas cannot legally be confiscated, but is subject to inspection by a belligerent. Resistance to inspection removes this immunity and subjects the property to condemnation by a prize court, which is charged with the preservation of the legal rights of the owners of neutral property.

(2) Neutral property engaged in contraband trade, breach of blockade, or unneutral service obtains the character of enemy property and is subject to seizure by a belligerent and condemnation by a prize court.

(3) When hostile and innocent property is mixed, as in the case of a neutral ship carrying a cargo which is entirely or partly contraband, this fact can only be determined by inspection. Such innocent property may be of uncertain character, as it has been frequently held that it is more or less contaminated by association with hostile property. For example, under the Declaration of London (which, so far as the provisions covering this subject are concerned, has been adopted by all the belligerents), the presence of a cargo which in bulk or value consists of 50 per cent contraband articles impresses the ship with enemy character and subjects it to seizure and condemnation by a prize court.

(4) Enemy property, including ships and cargoes, is always subject to seizure and condemnation. Any enemy property taken by a belligerent on the high seas is a total loss to the owners. There is no redress in a prize court. The only means of avoiding loss is by flight or successful resistance. Enemy merchant ships have, therefore, the right to arm for the purpose of self-protection.

(5) A belligerent warship is any vessel which, under commission or orders of its government imposing penalties or entitling it to prize money, is armed for the purpose of seeking and capturing or destroying enemy property or hostile neutral property on the seas. The size of the vessel, strength of armament, and its defensive or offensive force are immaterial.

(6) A belligerent warship has, incidental to the right of seizure, the right to visit and search all vessels on the high seas for the purpose of determining the hostile or innocent character of the vessels and their cargoes. If the hostile character of the property is known, however, the belligerent warship may seize the property without exercising the right of visit and search which is solely for the purpose of obtaining knowledge as to the character of the property. The attacking vessel must display its colors before exercising belligerent rights.

(7) When a belligerent warship meets a merchantman on the high seas which is known to be enemy owned and attempts to capture the vessel, the latter may exercise its right of self-protection either by flight or by resistance. The right to capture and the right to prevent capture are recognized as equally justifiable.

(8) The exercise of the right of capture is limited, nevertheless, by certain accepted rules of conduct based on the principles of humanity and regard for innocent property, even if there is definite knowledge that some of the property, cargo, as well as the vessel, is of enemy character. As a character of these limitations, it has become the established practice for warships to give merchant vessels an opportunity to surrender or submit to visit and search before attempting to seize them by force. The observance of this rule of naval warfare tends to prevent the loss of life of non-combatants and the destruction of innocent neutral property which would result from sudden attack.

(9) If, however, before a summons to surrender is given, a merchantman of belligerent nationality, aware of the approach of an enemy warship, uses its armament to keep the enemy at a distance, or after it has been summoned to surrender it resists or flees, the warship may properly exercise force to compel surrender.

(10) If the merchantman finally surrenders, the belligerent warship may release it or take it into custody. In the case of an enemy merchantman it may be sunk, but only if it is impossible to take it into port, and provided always that the persons on board are put in a place of safety. In the case of a neutral merchantman, the right to sink it in any circumstance is doubtful.

(11) A merchantman entitled to exercise the right of self-protection may do so when certain of attack by an enemy warship, otherwise the exercise of the right would be so restricted as to render it ineffectual. There is a distinct difference, however, between the exercise of the right of self-protection and the act of cruising the seas in an armed vessel for the purpose of attacking enemy naval vessels.

(12) In the event that merchant ships of belligerent nationality are armed and under commission or orders to attack in all circumstances certain classes of enemy naval vessels for the purpose of destroying them, and are entitled to receive prize money for such service from their government, or are liable to a penalty for failure to obey the orders given, such merchant ships lose their status as peaceable merchant ships and are to a limited extent incorporated in the naval forces of their government, even though it is not their sole occupation to conduct hostile operations.

(13) A vessel engaged intermittently in commerce and under a commission or orders of its government imposing a penalty, in pursuing and attacking enemy naval craft, possesses a status tainted with a hostile purpose which it cannot throw aside or assume at will. It should, therefore, be considered as an armed public vessel and receive the treatment of a warship by an enemy and by neutrals. Any person taking passage on such a vessel cannot expect immunity other than that accorded persons who are on board a warship. A private vessel, engaged in seeking enemy naval craft, without such a commission or orders from its government, stands in a relation to the enemy similar to that of a civilian who fires upon the organized military forces of a belligerent, and is entitled to no more considerate treatment.—*N. Y. Times*, 27/4.

On **May 5** Germany replied to the United States note of April 20. The reply asserts that German "submarine warfare has been in accordance with the general principles of visit and search" except "in the war zone surrounding Great Britain," and has been employed "in self-defence against the illegal conduct of British warfare." In conclusion it states that German naval forces have received the order that "vessels both within and without the area declared a naval war zone shall not be sunk without warning and without saving human lives unless the ship attempt to escape or offer resistance." If, however, the United States fails to secure "freedom of the seas" from Great Britain, "the German Government would then be facing a new situation in which it must reserve to itself complete liberty of decision."

The undersigned, on behalf of the Imperial German Government, has the honor to present to his Excellency the Ambassador of the United States, Mr. James W. Gerard, the following reply to the note of April 20 regarding the conduct of German submarine warfare.

The German Government handed over to the proper naval authorities for early investigation the evidence concerning the *Sussex*, as communicated by the Government of the United States. Judging by the results that the

investigation has hitherto yielded, the German Government is alive to the possibility that the ship mentioned in the note of April 10 as having been torpedoed by a German submarine is actually identical with the *Sussex*.

The German Government begs to reserve further communication on the matter until certain points are ascertained, which are of decisive importance for establishing the facts of the case. Should it turn out that the commander was wrong in assuming the vessel to be a man-of-war, the German Government will not fail to draw the consequence resulting therefrom.

In connection with the case of the *Sussex* the Government of the United States made a series of statements, the gist of which is the assertion that the incident is to be considered but one instance of a deliberate method of indiscriminate destruction of vessels of all sorts, nationalities, and destinations by German submarine commanders.

The German Government must emphatically repudiate the assertion. The German Government, however, thinks it of little avail to enter into details in the present stage of affairs, more particularly as the government of the United States omitted to substantiate the assertion by reference to concrete facts.

The German Government will only state that it has imposed far-reaching restraints upon the use of the submarine weapon, solely in consideration of neutrals' interests, in spite of the fact that these restrictions are necessarily of advantage to Germany's enemies. No such consideration has ever been shown neutrals by Great Britain and her allies.

The German submarine forces have had, in fact, orders to conduct the submarine warfare in accordance with the general principles of visit and search and the destruction of merchant vessels recognized by international law, the sole exception being the conduct of warfare against enemy trade carried on enemy freight ships encountered in the war zone surrounding Great Britain. With regard to these, no assurances have ever been given to the Government of the United States. No such assurances are contained in the declaration of February 8, 1916.

The German Government cannot admit any doubt that these orders were given or are executed in good faith. Errors actually occurred. They can in no kind of warfare be avoided altogether. Allowances must be made in the conduct of naval warfare against an enemy resorting to all kinds of ruses, whether permissible or illicit.

But apart from the possibility of errors, naval warfare, just like warfare on land, implies unavoidable dangers for neutral persons and goods entering the fighting zone. Even in cases where the naval action is confined to ordinary forms of cruiser warfare, neutral persons and goods repeatedly come to grief.

The German Government has repeatedly and explicitly pointed out the dangers from mines that have led to the loss of numerous ships.

The German Government has made several proposals to the government of the United States in order to reduce to a minimum for American travelers and goods the inherent dangers of naval warfare. Unfortunately the government of the United States decided not to accept the proposals. Had it accepted, the government of the United States would have been instrumental in preventing the greater part of the accidents that American citizens have met with in the meantime.

The German Government still stands by its offer to come to an agreement along these lines.

As the German Government repeatedly declared, it cannot dispense with the use of the submarine weapon in the conduct of warfare against enemy trade. The German Government, however, has now decided to make a further concession, adapting methods of submarine war to the interests of neutrals. In reaching its decision the German Government is actuated by considerations which are above the level of the disputed question.

The German Government attaches no less importance to the sacred principles of humanity than the government of the United States. It

again fully takes into account that both governments for many years co-operated in developing international law in conformity with these principles, the ultimate object of which has always been to confine warfare on sea and land to armed forces of belligerents and safeguard as far as possible non-combatants against the horrors of war.

But although these considerations are of great weight, they alone would not under present circumstances have determined the attitude of the German Government. For in answer to the appeal by the government of the United States on behalf of the sacred principles of humanity and international law, the German Government must repeat once more, with all emphasis, that it was not the German, but the British Government which ignored all accepted rules of international law and extended this terrible war to the lives and property of non-combatants, having no regard whatever for the interests and rights of neutrals and non-combatants that through this method of warfare have been severely injured.

In self-defence against the illegal conduct of British warfare, while fighting a bitter struggle for national existence, Germany had to resort to the hard but effective weapon of submarine warfare.

As matters stand, the German Government cannot but reiterate regret that the sentiments of humanity, which the government of the United States extends with such fervor to the unhappy victims of submarine warfare, are not extended with the same warmth of feeling to many millions of women and children who, according to the avowed intention of the British Government, shall be starved, and who by sufferings shall force the victorious armies of the Central Powers into ignominious capitulation.

The German Government, in agreement with the German people, fails to understand this discrimination, all the more as it has repeatedly and explicitly declared itself ready to use the submarine weapon in strict conformity with the rules of international law as recognized before the outbreak of the war, if Great Britain likewise was ready to adapt the conduct of warfare to these rules.

Several attempts made by the government of the United States to prevail upon the British Government to act accordingly failed because of flat refusal on the part of the British Government. Moreover, Great Britain again and again has violated international law, surpassing all bounds in outraging neutral rights. The latest measure adopted by Great Britain, declaring German bunker coal contraband and establishing conditions under which English bunker coal alone is supplied to neutrals, is nothing but an unheard-of attempt by way of exaction to force neutral tonnage into the service of British trade war.

The German people knows that the government of the United States has the power to confine the war to armed forces of the belligerent countries, in the interest of humanity and maintenance of international law. The government of the United States would have been certain of attaining this end had it been determined to insist, against Great Britain, on the incontrovertible rights to freedom of the seas. But, as matters stand, the German people is under the impression that the government of the United States, while demanding that Germany, struggling for existence, shall restrain the use of an effective weapon and while making compliance with these demands a condition for maintenance of relations with Germany, confines itself to protests against illegal methods adopted by Germany's enemies. Moreover, the German people knows to what considerable extent its enemies are supplied with all kinds of war material from the United States.

It will, therefore, be understood that the appeal made by the government of the United States to sentiments of humanity and principles of international law cannot, under the circumstances, meet the same hearty response from the German people which such an appeal otherwise always is certain to find here. If the German Government, nevertheless, is resolved to go

to the utmost limit of concessions, it has been guided not alone by the friendship connecting the two great nations for over 100 years, but also by the thought of the great doom which threatens the entire civilized world should the cruel and sanguinary war be extended and prolonged.

The German Government, conscious of Germany's strength, twice within the last few months announced before the world its readiness to make peace on a basis safeguarding Germany's vital interests, thus indicating that it is not Germany's fault if peace is still withheld from the nations of Europe. The German Government feels all the more justified in declaring that responsibility could not be borne before the forum of mankind and in history if after 21 months of the war's duration the submarine question, under discussion between the German Government and the government of the United States, were to take a turn seriously threatening maintenance of peace between the two nations.

As far as lies with the German Government, it wishes to prevent things from taking such a course. The German Government, moreover, is prepared to do its utmost to confine operations of the war for the rest of its duration to the fighting forces of the belligerents, thereby also insuring the freedom of the seas, a principle upon which the German Government believes, now as before, that it is in agreement with the government of the United States.

The German Government, guided by this idea, notifies the government of the United States that German naval forces have received the following order:

In accordance with the general principles of visit and search and the destruction of merchant vessels, recognized by international law, such vessels, both within and without the area declared a naval war zone, shall not be sunk without warning and without saving human lives unless the ship attempt to escape or offer resistance.

But neutrals cannot expect that Germany, forced to fight for existence, shall, for the sake of neutral interests, restrict the use of an effective weapon, if the enemy is permitted to continue to apply at will methods of warfare violating rules of international law. Such a demand would be incompatible with the character of neutrality, and the German Government is convinced that the government of the United States does not think of making such a demand, knowing that the government of the United States repeatedly declares that it is determined to restore the principle of freedom of the seas, from whatever quarter it has been violated.

Accordingly, the German Government is confident that in consequence of the new orders issued to the naval forces the government of the United States will also now consider all impediments removed which may have been in the way of a mutual co-operation toward restoration of the freedom of the seas during the war, as suggested in the note of July 23, 1915, and it does not doubt that the government of the United States will now demand and insist that the British Government shall forthwith observe the rules of the international law universally recognized before the war, as are laid down in the notes presented by the government of the United States to the British Government December 28, 1914, and November 5, 1915.

Should steps taken by the government of the United States not attain the object it desires, to have the laws of humanity followed by all belligerent nations, the German Government would then be facing a new situation in which it must reserve to itself complete liberty of decision.

The undersigned avails himself of this opportunity to renew to the American Ambassador assurances of highest consideration. VON JAGOW.

On **May 8** President Wilson despatched the following brief note stating that the United States would "rely upon a scrupulous execution henceforth of the now altered policy."

WASHINGTON, May 8.

The American Ambassador in Berlin was instructed to-day by cable to deliver the following note to the German Minister of Foreign Affairs:

The note of the Imperial German Government under date of May 4, 1916, has received careful consideration by the government of the United States. It is especially noted, as indicating the purpose of the Imperial Government as to the future, that it " is prepared to do its utmost to confine the operations of the war for the rest of its duration to the fighting forces of the belligerents " and that it is determined to impose upon all its commanders at sea the limitations of the recognized rules of international law upon which the government of the United States has insisted.

Throughout the months which have elapsed since the Imperial Government announced, on February 4, 1915, its submarine policy, now happily abandoned, the government of the United States has been constantly guided and restrained by motives of friendship in its patient efforts to bring to an amicable settlement the critical questions arising from that policy. Accepting the Imperial Government's declaration of its abandonment of the policy which has so seriously menaced the good relations between the two countries, the government of the United States will rely upon a scrupulous execution henceforth of the now altered policy of the Imperial Government, such as will remove the principal danger to an interruption of the good relations existing between the United States and Germany.

The government of the United States feels it necessary to state that it takes it for granted that the Imperial Government does not intend to imply that the maintenance of its newly announced policy is in any way contingent upon the course or result of diplomatic negotiations between the government of the United States and any other belligerent government, notwithstanding the fact that certain passages in the Imperial Government's note of the fourth instant might appear to be susceptible of that construction. In order, however, to avoid any possible misunderstanding, the government of the United States notifies the Imperial Government that it cannot for a moment entertain, much less discuss, a suggestion that respect by German naval authorities for the rights of citizens of the United States upon the high seas should in any way or in the slightest degree be made contingent upon the conduct of any other government affecting the rights of neutrals and non-combatants. Responsibility in such matters is single, not joint; absolute, not relative. LANSING.

METHODS OF U-BOATS—VESSELS MUST STOP

WASHINGTON, May 16.

Count von Bernstorff, has delivered to Secretary Lansing, under last Friday's date, a note verbale from the Imperial German Government suggesting that a neutral vessel may be attacked by a German submarine if, when challenged to halt, the vessel fails to obey and turns her bow toward the submarine. The text of the communication, dated May 12 and signed by Count von Bernstorff, is as follows:

" A German submarine in January last signaled with flags from a distance the Dutch steamer *Bandoeng* to stop. Instead of immediately complying with that summons, permissible under international law, the Dutch steamer turned at higher speed on the submarine, whose commander, on the assumption, warranted by the circumstances, that he had to do with an English ship in disguise, bent on attacking him, then opened fire on her.

" The steamer *Bandoeng* then stopped and sent over a boat for the examination of the ship's papers. On being asked about his captain's proceeding, the Dutch officer in command of the boat explained that he wanted to come nearer the submarine, so as to shorten the visitation formalities.

" The Imperial Government finds in the incident occasion to suggest to the neutral governments that the masters of their merchant ships be given to understand that in the event of their being stopped by German public vessels

the provisions of international law must be observed to the letter, and that their special attention be called to the dangers incurred by turning their ships on a submarine.

"Thus alone can incidents of the foregoing description be avoided, the responsibility for which would exclusively lie upon the neutral shipmasters." —*N. Y. Times* 17/5.

"TUBANTIA" TORPEDOED.—Germany now admits that the Dutch steamship *Tubantia* was torpedoed and not sunk by a mine and will give to the owners of the steamer a larger vessel from the Hamburg-American fleet, according to an official announcement made at The Hague May 2. The owners of the *Tubantia* will have to pay to Germany the difference in cost of the two vessels.—*Shipping Illustrated*, 6/5.

BRAZIL BEGINS U-BOAT INQUIRY.—The Brazilian Government has ordered an urgent inquiry into the sinking of the Brazilian steamship *Rio Branco* (556 tons). The vessel was sunk in the channel on May 2, and her crew landed at Blyth on the English coast.—*N. Y. Times*, 5/5.

BETHMANN-HOLLWEG'S SPEECH.—On April 5 the German Chancellor in a speech to the Reichstag gave interesting hints as to German war aims and peace wishes. The speech was in part as follows:

At the outbreak of the war I recalled Moltke's saying that we should have once more to defend in a bloody fight what we had won in 1870. We went out to battle for the protection of our unity and freedom—the whole nation united like one man. It is this united and free Germany that our enemies desire to destroy. Germany is again to become impotent as in former centuries, exposed to every lust for power on the part of its neighbors, the whipping boy of Europe, bound in fetters still after the war as regard the development of its economic strength. That is what our enemies mean by the destruction of their military power of Prussia. They will smash their heads. (Loud cheers.)

The Salvation of Europe.—And what, on the other hand, do we desire? The meaning and purpose of this war is for us a Germany so firmly built and so strongly protected that nobody again will fall into the temptation of desiring to destroy us, and that everybody in the wide world must recognize our right to the free exercise of our peaceful strength. It is at this Germany and not at the destruction of foreign peoples that we aim. It is the permanent salvation of the European Continent, which is to-day shaken in its deepest foundations.

What has the enemy coalition to offer to Europe? Russia offers the fate of Poland and Finland; France the pretension to that hegemony which was our misery; and England the state of division and permanent friction which she likes to call the balance of power on the continent, and which is the inmost cause of the untold misery which this war has brought upon Europe. (Hear, hear.) If the three powers had not united against us, and had not attempted to reverse the wheels of history to times which have passed away for ever, the peace of Europe would gradually have been fortified by the strength of quiet development. To achieve this was the purpose of German policy before the war. We could have by peaceful labor what we wanted. Our enemies chose war. (Dr. Liebknecht: "It was you who chose war." Uproar, and cries of "scoundrel," "ruffian," and "out with him.")

The President called Dr. Liebknecht to order, and the Chancellor continued:

And so the peace of Europe must rise again out of a sea of blood and tears —out of the grave of millions.

We went out, then, gentlemen, in our defence, but what was before is no longer to-day. History has advanced with iron step, and there is no going back. Germany and Austria-Hungary had not the intention to open the Polish question. The fortune of battles has opened it, and now it is there

and awaits its solution. Germany and Austria-Hungary must and will solve it. (Cheers.) After such shocks history does not recognize the *status quo ante*. (Hear, hear.) Poland after the war will be a new Poland. The Poland which was left by the Russian police officials, hastily pocketing their bribes, and by the Russian Cossack, burning and plundering, exists no more. Even members of the Duma have openly said that they cannot imagine the return of the *chinovnik* to the place where a German, an Austrian, and a Pole have meanwhile labored honestly for the unhappy country.

Herr Asquith speaks of the principle of nationalities. When he does that, and if he can put himself in the place of his unconquered and invincible enemy—can he really suppose that Germany would even again of her free will surrender to the rule of reactionary Russia the peoples that have been liberated by Germany and her allies between the Baltic Sea and the Volhynian swamps, be they Poles, Lithuanians, Balts, or Letts? No, gentlemen, not a second time shall Russia be allowed to mobilize her armies on the unprotected frontier of East and West Prussia. (Storm of applause.) Not again shall Russia with the help of French gold use the land of the Vistula as a gate of invasion, and fall upon unprotected Germany.

The Future of Belgium.—Just as little can anybody suppose that in the west we shall, without complete security for our future, give up (*freigeben*) the occupied territories in which the blood of our people has flowed. We shall create for ourselves real guarantees that Belgium shall not be made into an Anglo-French vassal state and into military and economic bulwark against Germany. (Cheers.) Here also there is no *status quo ante*. Here also fate does not retrace its steps. Here also Germany cannot again give over to Latinization the long-oppressed Flemish race. (Loud cheers, Dr. Liebknecht, "hypocrisy!") Germany will secure for the Flemish race a healthy development in accordance with its rich qualities and upon the basis of its lowland (*niederlandisch*) language and pecularities. We desire to have neighbors who will not again unite against us to throttle us, but who will work with us, as we with them, for our mutual profit. (Dr. Liebknecht: "And then you will fall upon them. Invasion of Belgium!" A member of the center party shouted to Dr. Liebknecht, "Get away to Russia!") Were we before the war Belgium's enemies? Did not peaceful German work and peaceful German industry co-operate at Antwerp, for all far and wide to see, in the welfare of the country? Are we not even now during the war starving to restore the life of the country as far as the war allows? The memory of the war will continue for long in the country that has had so grievous a visitation but—in our mutual interests—we cannot allow fresh wars to arise from that.

One other question I should like to touch upon. Since the beginning of the war the Russian Government has done all it can to rob and to drive away Germans of both German and Russian nationality. It is our right and our duty to demand of the Russian Government that it shall make good the wrong thus done to all human rights, and that it shall open the door out of Russian bondage for our persecuted and tortured countrymen. (Cheers.)

Gentlemen, the Europe which will arise out of this most tremendous of all crises will in many respects be unlike the old Europe. The blood that has been shed and the property that has been wasted can be restored but slowly. In any case, Europe must be for all the peoples that inhabit it a Europe of peaceful labor. The peace which ends this war must be a lasting peace. It must not contain in it the seeds of new wars, but the seeds of a final peaceful regulation of European affairs. (Dr. Liebknecht: "Begin by making the German people free!" Great disturbance in the House.)

During our long association in war we have grown closer and closer to our allies. The comradeship in war must and will be followed in peace by association in labor—in the service of the economic and cultural welfare of ever more firmly united peoples.

The Trade War.—Here also we walk other ways than our enemies. Even after the conclusion of peace England desires not to let the war cease, but rather to continue against us with redoubled strength the trade war.

First militarily, and then economically are we to be destroyed. Everywhere there is brutal rage to destroy and to annihilate, and the calculated desire in unbridled lust of domination to cripple a people of 70 millions. These menaces also will come to nothing. But let the enemy statesmen who use such words remember this: the more violent their words, the sharper our blows.

And what when we look away beyond Europe? Cut off from all connections with the home country, our troops and our fellow countrymen have stubbornly defended our colonies, and in East Africa they are still heroically disputing every foot of soil. But the final fate of our colonies will not be decided there, but, as Bismarck said, here on the continent, and our victories on the continent will once more secure to us colonial possessions, and open the way in the wide world for new and fruitful activity of the indestructible German spirit of enterprise.—*London Times,* 10/4.

ASQUITH'S REPLY.—On April 9 Premier Asquith, in a speech given at a dinner to French senators and deputies, replied to Bethmann-Hollweg's address.

The following are the chief points in Mr. Asquith's statement defining the policy of the Allies:

The German Chancellor has suggested that if there are to be peace discussions England must assume the attitude of a defeated to a victorious enemy. But we are not defeated; and we are not going to be defeated.

Our peace terms are the accomplishment of the purposes for which we took up arms. England and France were both driven to that course in order to prevent Germany (*i. e.,* Prussia) from establishing a position of military menace and dominance over her neighbors.

The Allies' purpose is to defeat Germany's attempt to secure ascendancy by tearing up the treaty basis of European policy, and so to pave the way for an international system which will secure the principle of equal rights for all civilized states.

We intend to establish the principle that international problems must be handled by free negotiation on equal terms between free peoples, unhampered by overmastering Prussian military dictation.

We are the champions not only of treaty rights, but of the independent status and free development of the weaker countries.

The German Chancellor talks of giving the various races "the chance of free evolution along the lines of their mother tongue and of national individuality." The attempt to Germanize Prussian Poland for 20 years, with the flogging of Polish children who refused to say their prayers in German, forms a black chapter even in the annals of Prussian culture.

The Chancellor says there must be a *new* Belgium, between which and her pillagers in this war there is to be the "collaboration of neighbors." The Allies are determined to restore the *old* Belgium.—*London Times,* 11/4.

DUTCH MOBILIZATION.—The extensive mobilization of the Dutch Army, early in April, has been variously attributed to fear of a British invasion on the one hand, or on the other, to fear of a German plan to forestall such invasion by methods similar to those employed in Belgium. In the Reichstag, on April 5, a member referred to the matter as follows:

Neutrals are in no comfortable position. The pressure on Holland has reached a point at which it is no longer a matter affecting Holland alone. She sees herself obliged to protect her coasts, not against the Central Powers, but against the Entente. Holland had been warned by the example of Greece's tragic fate. We must make it plain here that we feel ourselves not only to be of the same race as Holland, but feel most keenly that Holland is also suffering for our sake. Their attitude against Holland aims at cutting off the breath of Germany. I have deep respect for the great strength of the Dutch people which, loyal to its history, has stood up for independence and freedom.—*London Times,* 8/4.

DECISION IN "APPAM" CASE.—On May 16 Secretary Lansing made public the text of the note of March 2 stating the decision of the U. S. Government regarding the British steamship *Appam*, captured by the *Moewe* and sent to Hampton Roads as a prize. The German Government had requested that the *Appam* be permitted to remain in American waters until further notice, under Art. XIX of the Prussian-American Treaty of 1799, which reads as follows:

"The vessels of war, public and private, of both parties shall carry (conduire) freely, wheresoever they please, the vessels and effects taken (pris) from their enemies, without being obliged to pay any duties, charges, or fees to officers of Admiralty, of the customs, or any others; nor shall such prizes (prises) be arrested, searched, or put under legal process when they come to and enter the ports of the other party, but may freely be carried (conduites) out again at any time by their captors (le vaisseau preneur) to the places expressed in their commissions, which the commanding officer of such vessel (le dit vaisseau) shall be obliged to show. But conformably to the treaties existing between the United States and Great Britain, no vessel (vaisseau) that shall have made a prize (prise) upon British subjects shall have a right to shelter in the ports of the United States, but if (il est) forced therein by tempests, or any other danger or accident of the sea, they (il sera) shall be obliged to depart as soon as possible."

In interpreting this Article, Secretary Lansing's note states that it is applicable only to prizes brought into port by vessels of war. The *Appam* was not so accompanied. Hence the *Appam* is entitled only to the ordinary privileges of temporary refuge granted to prizes by maritime nations, and not to the privilege of "indefinite asylum." The question of the jurisdiction of the United States court in the libel proceedings brought by the British owners, is left to the decision of the court.

UNITED STATES AND GREAT BRITAIN

BRITAIN DEFENDS BLOCKADE.—In a 13,000-word note, summarized in the press of April 25, Great Britain, with the concurrence of the French Government, again justifies the effectiveness of her blockade of Germany and reiterates the military necessity of regulating commerce to neutrals contiguous to Germany. The note makes the following points:

(1) It justifies *sending ships to port* for search by pointing to the danger of submarine attack, the ingenious devices for the concealment of contraband, and the German practice of misusing United States passports to procure safe conduct for military agents.

(2) Regarding *prize court procedure*, it declares that the prize court has power to decide that an act under orders in council is illegal if it violates international law, and cites the *Zamora* case which secures the right to invoke international law before the prize court.

(3) Regarding *ultimate destination*, it quotes U. S. figures showing that exports to Holland and Scandinavian countries increased from $97,000,000 in 1913 to $235,000,000 in 1915; it cites evidence of false consignments to dock laborers, bakers, etc.; and it calls attention to the U. S. Supreme Court's doctrine of "continuous voyage."

(4) Regarding the *effectiveness of the blockade*, it asserts that passage of goods across a land frontier or inland sea has never been held to invalidate a blockade. "It is doubtful whether there has ever been a blockade where the ships that slipped through bore so small a proportion to those which were intercepted."

TRADING WITH THE ENEMY ACT.—On April 13 the State Department made public its correspondence with the British Foreign Office regarding the British Enemy Trading Act of December 23. The object of this act, as interpreted by Secretary Lansing in a note dated January 19, was apparently "to prevent any persons doing business in the United Kingdom from trading with enemies of Great Britain or with persons having enemy association in any other part of the world." This, in the view of the Secretary, might interfere with the right of traders domiciled in the United States to do business with belligerents.

The British reply, dated February 16, admits "the right of persons of any nationality, resident in the United States to engage in legitimate commercial transactions with any other persons," but insists on the "right of other governments to restrict the commercial activities of their nationals —by the imposition of prohibitions and penalties which are operative solely upon persons under their jurisdiction."—*N. Y. Times*, 14/4.

THE ALLIES AND THE MAILS.—The Allied Governments announce that whereas both the "Letter Post" and the "Parcel Post" have been abused by the enemy for the transmission of contraband packages, and whereas Convention XI of The Hague Conference in 1907 relating to the immunity of the mails cannot be held to apply to other than *bona fide* postal correspondence:

(1) As regards the right of search, and eventually of arrest and seizure, goods dispatched as postal packages cannot and will not be treated otherwise than goods dispatched in any other form;

(2) The immunity of postal correspondence, as stipulated by the 11th Hague Convention of 1907, in no wise affects the right of the Allied Governments to examine, and if necessary to arrest and to seize, goods concealed in wrappers, envelopes, or letters contained in the mail-bags;

(3) The Allied Governments, faithful to their engagements and duly respectful of genuine "correspondence," will continue, for the moment, to abstain from seizing on the high seas and confiscating such communications, letters, or dispatches, and will ensure their transmission with all possible expedition, as soon as their genuine character has been established. —*London Times*, 3/4.

"CHINA" PRISONERS RELEASED.—On May 5 the British Foreign Office announced its decision to release immediately the 38 Germans and Austrians seized from the American steamer *China* on February 19. The prisoners were taken off by the British auxiliary cruiser *Laurentic* on the high seas. According to the British statement they were on their way from Shanghai to Manila to make that place a base for the perpetration of unneutral acts against the Allies. A protest was made by the United States on February 23.

NEW CONTRABAND LIST.—On April 19 the British Government issued a new contraband list. The prefatory announcement states that "for practical purposes the distinction between the two classes of contraband [conditional and absolute] has ceased to have any value" in view of the fact that the enemy country has taken control of practically all the articles in the list of conditional contraband.

IRISH REVOLT.—An insurrection in Ireland began on April 24 when the Sinn Feiners seized the post office, city hall, and whole districts in Dublin, and cut off telegraph communication with England. The authorities obtained troops from England and proclaimed martial law throughout Ireland. On April 29 the rebel leaders agreed to unconditional surrender and a proclamation was issued by "Provisional President" Pearce, calling on his followers to lay down their arms. Eleven of the leaders have been

executed, and 38 who were condemned to death have had their sentences commuted. Mr. Birrell, chief secretary for Ireland, resigned on May 4.

"ZAMORA" CASE.—The copper cargo of the Swedish steamer *Zamora*, New York to Stockholm, was held for the prize court last June, and was later requisitioned by the British Government. The president of the prize court granted to the owners of the copper the right of appeal. The Judicial Committee of the Privy Council, to whom the case was taken, granted the right of appeal and also reversed the decision of the prize court in holding the copper (April 8).

Little attention has been given to the decision of the Judiciary Committee of the British Privy Council to permit an appeal from the findings of a prize court, but one of the American counsel interested declares that it is a "milestone in prize court procedure in the present war." The point is that it puts international law above English law. In the case in question—relating to the seizure of a cargo of copper—the judge, Sir Samuel Evans, had held, in effect, that an Order in Council was certain to be enforced by a prize court. But that really depends upon the order conforming to the law of nations. This is the position firmly taken in the American note to the British Government; and now we have that government itself assenting to it in principle. A way is provided to test an Order in Council by the higher standard of international law. It is a gratifying indication that the best English and American precedents are to be followed.—*Nation*, 13/4.

BALKAN STATES

THE FATE OF MACEDONIA.—Both Greece and Bulgaria are concerned over the prospect of making good their conflicting claims to territory in Macedonia. General Jekoff, Bulgarian commander-in-chief, makes the following statement in an interview published in the *N. Y. World* (April 7):

We have conquered Macedonia, but as long as the English and French remain at Salonika our position is dangerous. We want to attack them before they get stronger, and besides, we are not sure what Greek policy will be and what the Rumanians will do in the spring. But the Germans are not willing to make an offensive against Salonika. They are satisfied now that communications between Berlin and Constantinople are open, and moreover they consider it to their interests to have as large English and French forces as possible at Salonika inactive. If they are driven from the Balkans they may go to another front, and the Germans fear they may land on the Asiatic shore and cut communications between Constantinople and Bagdad and Egypt. As for us, we are anxious that the Entente forces should be driven away, so that we may be free to watch the Rumanians.—*N. Y. World*, 7/4.

On the other hand, ex-Premier Venizelos, in article in the *Athens Kirix* of April 2, after condemning the "chronic peaceful war through purposeless mobilization which has brought Greece to the verge of economic and moral bankruptcy," proceeds to criticise King Constantine's foreign policy.

M. Venizelos lays great stress on the Bulgarian peril for Greece, pointing out that the utmost to be gained from the present policy would be to leave Greece the same size, while Bulgaria, flushed with victory, trained by war, enlarged by the addition of Serbia and Macedonia, and allied with the Turks, would not wait long before falling upon its southern neighbor.

"Who thinks," he declared, "that under those conditions Greece could unaided drive the Bulgars from Macedonia once they have seized it is a fool. The politicians who do not now see this inevitable danger are blind, and unfortunate are the kings following such politicians, and more unfortunate still the lands whose sovereigns fall their victims."

With reference to the royal thesis that Germany guarantees that the Bulgars will evacuate Greek Macedonia, M. Venizelos impales the government on the horns of the dilemma that if Germany's assurances are formal and binding Greek mobilization was never necessary, while if the assurances are not trustworthy mere passive, armed watching Bulgaria increase in size and resources would be wholly insufficient to save Greece from the Bulgar peril.—*N. Y. Times,* 3/4.

RUMANIA'S NEW TREATIES.—According to press despatches of April 14, a commercial agreement was signed on April 7 between Rumania and the Central Powers. The agreement is said to provide for the sale to Germany of Rumanian surplus cereals, without the exchange of German or Austrian products, and to permit the transit of traffic to and from Constantinople.

FAR EAST

CHINESE REPUBLIC RESTORED

WASHINGTON, March 24.

The Chinese Legation to-day received from the Peking Government the official text of the mandate issued on March 21 by Yuan Shih-kai, who for a brief period was designated as Emperor of China, and by which the restoration of the republic was ordered with Yuan Shih-kai as the president.

"I have myself to blame for my lack of virtue," says President Yuan, and he then asserts that "I hope to imitate the example of the sincerity of ancients by shouldering all the blame so that my action will fall in line with the spirit of humanity which is the expression of the will of heaven." The mandate concludes with the statement by President Yuan Shih-kai that he cannot remain idle while the country is racing to perdition, and appeals to all generals and others to rally around the republic.

Military governors of various provinces were responsible for Yuan Shih-kai's sudden decision. General Lung Chi-kuang, military governor of Canton, who has been unable to leave his bomb-proof home since January because of the strained conditions there, advised Yuan Shih-kai that he was doing all in his power to keep Kwang-Tung Province in submission, but did not feel that he would be able to hold the rebels in check much longer, unless relief were afforded by the cancellation of the monarchy.

Five of the other Military Governors of China communicated with neighboring provinces in an effort to frame an unanimous appeal to Yuan Shih-kai for the abandonment of the monarchy. However, the Emperor-elect heard of this move, and his sudden renunciation of the throne came about before any joint appeal from the military governors reached him.—*N. Y. Times,* 1/5.

RUSSO-JAPANESE ENTENTE

PETROGRAD, April 28, (via London, April 30).

Regarding the lately circulated rumors about an approaching agreement or understanding between Russia and Japan looking toward the future control of China to the exclusion of other nations and a defiance of the "open door," the Foreign Ministry informs me that Japan and Russia, as allies, are constantly exchanging their views on questions of mutual importance, but that no formal agreement harmful to foreign interests is under consideration.—*N. Y. Times,* 30/4.

THE CHINESE REVOLUTION.—The Chinese embroglio will cause us no disquiet unless it threatens to have an affect on the war by sowing dissention between Russia and Japan. The diplomatic evolution of the last 10 years has led these adversaries of 1904-05, not toward a second conflict, but toward mutual co-operation more and more definitely recognized and likely to become a dominant factor in the Far East.—*Journal des Débats.* 9/4.

UNITED STATES AND MEXICO

WASHINGTON, May 4.

President Wilson to-day approved the tentative agreement reached between Major General Hugh L. Scott, Chief of Staff, and General Alvaro Obregon, the Carranza Minister of War, in their Juarez-El Paso conferences relative to plans for co-operation between the American and Mexican forces in the case of Francisco Villa and his bandits.

President Wilson issued a formal statement at 10 o'clock to-night as follows:

I have examined, with the Secretary of War, the report made by General Hugh L. Scott of the conference between him and General Obregon, Secretary of War of the Republic of Mexico.

The report includes a tentative agreement regarding the future operations of both the American and Mexican military forces, and evidences cordial cooperation between the two governments in their common purpose.

As this agreement is being submitted to the *de facto* government of Mexico, it would not be proper for me to permit its publication until that government has had an opportunity to examine and consider its provisions. The full text of the proposed agreement will be given out immediately upon its acceptance by both governments. In general, I may say that it provides a basis of co-operation which promises to prevent misunderstanding and strengthens the cordial relations of the two republics. —*N. Y. Times*, 5/5.

GENERAL SCOTT'S REPORT.—The net result of General Scott's conferences with General Alvaro Obregon, the Carranza Minister of War, is as follows:

First—General Scott is convinced that the Carranza de facto Government understands that the purpose of the United States in sending troops into Mexico is not aggression or armed intervention.

Second—General Obregon has agreed to send 10,000 picked troops into the Big Bend and Parral regions of Mexico to stamp out bandits.

Third—General Obregon has given orders to General Trevino to endeavor to head off the bandits who raided Glenn Springs and Boquillas.

Fourth—The United States troops will remain in Mexico until the Carranza Government demonstrates that it has power to control the situation in Northern Mexico and where the United States Government has no troops.

Fifth—General Obregon also gives assurances that the Carranza forces will not move from Sonora through Pulpito Pass to operate in the rear of General Pershing's column and will not attack American troops.

Sixth—Every effort shall be made by Carranzistas to free Jesse Deemer, the American whom the Big Bend bandits kidnapped.—*N. Y. Times*, 17/5.

Acuteness was added to the situation in Mexico by the announcement that on May 5 a band of Mexicans had raided the American settlements of Glen Springs and Boquillas, looting and burning the places, and killing American soldiers and civilians. Gen. Funston has organized forces for the pursuit of the raiders, and Secretary Baker on Tuesday announced that President Wilson had called out the militia of Texas, Arizona, and New Mexico. Two additional regiments of regular infantry have also been ordered to the border.—*N. Y. Nation*, 11/5.

COSTA RICA OBJECTS.—It was reported last week that Costa Rica had protested against the ratification of the Nicaragua treaty recently by the U. S. Senate and had begun suit before the Central American Court of Justice against Nicaragua. Costa Rica bases her claims to be consulted, before any treaty is entered into disposing of Nicaragua Canal rights, on the geographic fact that the San Juan River forms the boundary line between Nicaragua and Costa Rica. According to the old Nicaragua Canal route plans, this river for about 25 miles was to have been canalized. In

ratifying this treaty recently the Senate adopted a resolution that provided that nothing in said convention is intended to affect any existing right of any of the states of Costa Rica, Salvador or Honduras, guaranteeing that so far as the U. S. Government was concerned, the former should lose no valid right through our negotiations with Nicaragua.

Costa Rica has another ground for protest, found in the text of a protocol still in force executed in 1900 and which agrees that when the President of the United States is authorized by law to acquire control of such portion of the territory belonging to Costa Rica on which to construct and protect a canal, these two governments would naturally enter into negotiations with each other to settle the plans and agreements in detail found necessary to accomplish the construction and provide for the ownership and control of the proposed waterway. Protests from Honduras and Salvador have also been recorded on the right of the Nicaragua Canal to concede to the United States a naval base in the Gulf of Fonseca upon which Salvador and Honduras have frontage as well as Nicaragua.—*Marine Journal*, 15/4.

NAVAL NOTES

Naval developments in the following strategic areas will be considered separately and in turn:

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TABLE OF NAVAL LOSSES OF THE VARIOUS BELLIGERENTS SINCE THE OUTBREAK OF WAR

The following table is compiled from various articles appearing in the press of the several belligerent nations. These reports are so contradictory that it is impossible to furnish an absolutely correct list of vessels lost to date. In many cases the belligerent powers have failed to acknowledge the losses of all the vessels. No attempt has been made to include herein a list of the various trawlers, mine-sweepers and such odd small craft which may have been destroyed while mine-sweeping or on submarine patrol duty.

(On the left margin of this table of losses is a page reference to the Naval Institute War Notes.)

Losses of Great Britain and Her Allies

BRITISH WARSHIP LOSSES

PAGE VOL. 41	PAGE VOL. 42	NAME	TYPE	TONNAGE	REMARKS	DATE
245, 653, 1874		Audacious	battleship	24,000	Reported sunk off Irish coast. Cause not known. Loss neither affirmed nor denied by British Admiralty	29-10-14
247		Bulwark	battleship	15,000	Blown up by internal explosion while at anchor in the Thames	25-11-14
644		Formidable	battleship	15,000	Sunk by German submarine, North Sea	1- 1-15
658		Irresistible	battleship	15,000	Sunk in the Dardanelles	18- 3-15
658		Ocean	battleship	12,950	Sunk in the Dardanelles	18- 3-15
	300, 652	King Edward VII	battleship	16,350	By mine	9- 1-16
1373		Goliath	battleship	12,950	Torpedoed in Dardanelles	12- 5-15
1374	313	Triumph	battleship	11,800	Sunk by submarine in the Dardanelles	25- 5-15
1374		Majestic	battleship	14,900	Sunk by submarine in the Dardanelles	27- 5-15
	1044	Russel	battleship	——		
	300, 652	Natal	armored cruiser	13,360	Internal explosion and sunk at anchor	30-12-15
1583		Warrior	armored cruiser	13,550	By mine	5- 9-14
1567		Amphion	light cruiser	3,360	Sunk by mine in the North Sea	6- 8-14
1583		Pegasus	light cruiser	2,135	Sunk by German cruiser Koenigsberg at Zanzibar	20- 9-14
	652	Arethusa	light cruiser	3,750	By mine off East Coast of England	14- 2-16
249		Hermes	light cruiser	5,600	Sunk by German submarine U-27, North Sea	31-10-14
		Penelope	light cruiser	——		
1863		Hogue	armored cruiser	12,000	Sunk by German submarine U-29 in the North Sea	22- 9-14
1863		Cressey	armored cruiser	12,000	Sunk by German submarine U-29 in the North Sea	22- 9-14
1863		Aboukir	armored cruiser	12,000	Sunk by German submarine U-29 in the North Sea	22- 9-14
1867		Hawke	armored cruiser	7,350	Sunk by German submarine U-9, North Sea	16-10-14
271, 1886		Good Hope	armored cruiser	14,100	Sunk by German forces in Pacific	1-11-14
271, 1886		Monmouth	armored cruiser	9,800	Sunk by German forces in Pacific	1-11-14
2133		Argyll	armored cruiser	10,850	Ran aground off east coast of Scotland	28-10-15

271, 1886	Monmouth	armored cruiser	9,800	Sunk by German forces in Pacific	1-11-14
2133	Argyll	armored cruiser	10,850	Ran aground off east coast of Scotland	28-10-15
	Bullfinch	destroyer	370	Sunk in collision with a Dutch merchant ship	18- 8-14
	——	destroyer	——	Ran ashore, Scotch coast	27-12-14
	Erne	destroyer	550	Wrecked in a storm probably in	- 2-15
1364, 1007	Recruit	destroyer	385	Sunk by German submarine in North Sea	1- 5-15
1364, 1004	Maori	destroyer	1,035	Blown up by a mine off Belgian coast	7- 5-15
1728	Lynx	destroyer	935	Sunk by mine	10- 8-15
316	Louis	destroyer	965	Wrecked in the Eastern Mediterranean	10-11-15
655	Coquette	destroyer	355	Sunk by mine, North Sea	?- 3-16
1366	No. 10	torpedoboat	244	Sunk by German submarine in North Sea	10- 6-15
1366	No. 12	torpedoboat	253	Sunk by German submarine in North Sea	10- 6-15
2140	No. 96	torpedoboat	130	Sank after a collision with merchantman in Straits of Gibraltar	1-11-15
655	No. 11	torpedoboat	253	Sunk by mine, North Sea	?- 3-16
1583	Speedy	torpedo gunboat	810	Sunk by mine in the North Sea	3- 9-14
250, 1873	Niger	torpedo gunboat	810	Sunk by German submarine while at anchor	11-11-14
1583	AE-1	submarine	725-810	Accidentally sunk off Australian coast	14- 9-14
1871	E-3	submarine	725-810	Rammed and sunk by German vessel	18-10-14
247, 1873	D-5	submarine	550-600	Sunk by German mine, North Sea	3-11-14
	D-2	submarine	550-600	Reported by press at lost. Details not known	1-12-14
	E-10	submarine	725-810	Did not return from a trip into the North Sea	
1018	E-15	submarine	725-810	Ran aground in the Dardanelles and destroyed by own picket boats	17- 4-15
653	——	submarine	——	Stranded, Dutch Coast	6- 1-16
1373	652 E-17	submarine	725-810	Reported as sunk off Holland	6- 1-16
1727, 2136	AE-2	submarine	725-810	Sunk in the Sea of Marmora	30- 4-15
	E-13	submarine	725-810	Sunk by German torpedo craft off Danish coast	19- 8-15
2147	E-7	submarine	725-810	Sunk at Dardanelles	4- 9-15
2146	316 E-20	submarine	——	Announced as sunk by Turks in Dardanelles	5-11-15
	1040 E-22	submarine	——	Sunk off Holland	6- 1-16
1874	Oceanic	auxiliary cruiser	17,274	Ran aground off north coast of Scotland in storm	8- 9-14
653	Alcantara	auxiliary cruiser	15,300	Sunk in battle, North Sea	29- 2-16
	Rohilla	auxiliary cruiser	7,400	Ran aground off Whitby and completely wrecked	30-10-14
649	Viknor	auxiliary cruiser	5,386	Lost off Irish coast	14- 1-15
	Clan Macnaughton	auxiliary cruiser	4,985	Lost in a gale	3- 2-15
1005	Bayano	auxiliary cruiser	5,948	Probably torpedoed by German submarine in Irish Sea	12- 3-15
1729	Ramsey	auxiliary cruiser	——	Sunk by German auxiliary cruiser Meteor in North Sea	8- 8-15
1728	India	auxiliary cruiser	7,900	Sunk by German submarine, North Sea	10- 8-15

BRITISH WARSHIP LOSSES—Continued

PAGE VOL. 41	PAGE VOL. 42	NAME	TYPE	TONNAGE	REMARKS	DATE
	1039	Alcantara	auxiliary cruiser	——		
1365		Princess Irene	minelayer	——	Blown up by internal explosion off Sheerness	27- 5-15
	1040	Medusa	minelayer	——		
1755		Royal Edward	transport	11,117	Sunk by submarine in Ægean Sea	14- 8-15
2138		Marquette	transport	7,057	Sunk by German submarine in Ægean Sea	26-10-15
2138		Ramazan	transport	3,477	Sunk by German submarine in Ægean Sea	17- 9-15
	309	Woodfield	transport	——	Sunk off coast of Morocco	30-11-15
		Hythe	auxiliary	201	Collision, Ægean	29-10-15
2140	309	Tara	armored boarding vessel	6,322	Sunk by German submarine in Mediterranean Sea	5-11-15
	309	Abbas	Egyptian coast guard	298	Sunk by German submarine off Sollum Harbor	6-11-15
	309	Abdel Monaym	Egyptian coast guard	598	Sunk by German submarine off Sollum Harbor	6-11-15
		Fishguard II	training ship	——	Foundered in a gale in the North Sea	17- 9-14
	301	Anglia	hospital ship	1,862	Sunk by mine, English Channel	17-11-15
253, 1583		Pathfinder	light cruiser	2,940	Sunk by German submarine in North Sea	5- 9-14
	301	Aries	yacht	——		15
	301	Irene	yacht	——		15

In addition to the above, the press reports that several other English submarines have been destroyed. The list above includes only those which were apparently officially announced by the British Admiralty.

FRENCH WARSHIP LOSSES

658	Bouvet	battleship	12,007	Sunk at the Dardanelles	18- 3-15
1012	Leon Gambetta	armored cruiser	12,352	Torpedoed by Austrian submarine in the Straits of Otranto	26- 4-15
661	Amiral Charnier	cruiser	4,702	Torpedoed, Mediterranean	8- 2-16
666	Mousquet	destroyer	298	Sunk by German cruiser Emden at Penang	28-10-14
656	Dague	destroyer	720	Sunk by Austrian mine off Antivari	24- 2-15
	Branlebas	destroyer	330	Sunk by mine	
661	Renaudin	destroyer	756	Torpedoed, Adriatic	18- 3-16
	No. 347	torpedoboat	97	Sunk in collision with each other	9-10-14
	No. 338	torpedoboat	97	Sunk in collision with each other	9-10-14
	——	torpedoboat	——	Reported to have been lost in	-1-15
	No. 331	torpedoboat	97	Sunk in collision off Cherbourg	16- 6-15
	No. 219	torpedoboat	87	Sunk off Nieuport	- 1-15
260	Curie	submarine	392	Sunk by Austrians at Pola	23-12-14
655	Saphir	submarine	386- ?	Sunk at the Dardanelles	15- 1-15
	Joule	submarine	392- ?		

Calypso	submarine	345-490	Rammed and sunk during maneuvers off Cape Lardier	8- 7-15

655	Saphir	submarine	386- ?	Sunk at the Dardanelles	15- 1-15	
	Joule	submarine	392- ?			
	Calypso	submarine	345-490	Rammed and sunk during maneuvers off Cape Lardier	8- 7-15	
1756	Mariotte	submarine	522-615	Sunk at the Dardanelles	20- 7-15	
2142	Turquoise	submarine	386- ?	Sunk in the Sea of Marmora	3-11-15	
308	Fresnel	submarine	392- ?	Sunk in the Adriatic by an Austrian ship	5-12-15	
	Zelée	gunboat	636	Sunk by German cruisers at Tahiti	22- 9-14	
662	Provence	auxiliary cruiser	18,400	Torpedoed, Mediterranean	26- 2-16	
	Indian	auxiliary cruiser	800	Sunk by submarine off Rhodes	8- 9-15	
1375, 1755	Casa Bianca	minelayer	945	Sunk in the Ægean Sea by a mine	3- 6-15	
	Calvados	troopship	——	Submarine, Mediterranean	-11-15	
308	Monge		392- ?	Sunk by Austrians in Adriatic	28-12-15	

RUSSIAN WARSHIP LOSSES

	NAME	TYPE	TONNAGE	REMARKS	DATE
	Pallada	armored cruiser	7,775	Sunk by German submarine in Baltic	11-10-14
267, 666	Jemtchug	cruiser	3,130	Sunk by German cruiser in Penang	28-10-14
664	Leit Pushtscheen	torpedoboat	——	Sunk by mine, Black Sea	10- 3-16
	Putschino	torpedoboat	——	By gun fire	30-10-14
	Donnetz	gunboat	1,224	Sunk by Turks in Black Sea. Raised by Russians	31-10-14
	Kubanez	gunboat	1,280	Reported by Turks as having been sunk by a Turkish destroyer	29-10-14
1732	Sivutch	gunboat	875	Sunk by Germans in Baltic Sea	20- 8-15
	Kubanetz	gunboat	1,200	By gun fire, Odessa	29-10-14
261	Prut	auxiliary cruiser	5,440	Scuttled to avoid capture	29-10-14
1367	Yenisei	minelayer	2,926	Sunk by a German submarine in Baltic	4- 6-15
	Oleg	minelayer	1,125	Sunk, Black Sea	24-12-14
	Athos	minelayer	1,743	Sunk, Black Sea	24-12-14
	Riasan	transport	3,522	Captured by Emden	6- 8-14
1045	Portugal	hospital ship	——		

Various German reports state that Russian men-of-war were destroyed in the several minor engagements in the Baltic. These losses were never officially announced by the Russian Admiralty.

JAPANESE WARSHIP LOSSES

	Shirotaye	destroyer	380	Ran ashore, Tsing Tao	4- 9-14
	No. 33	torpedoboat	82	Sunk by mines while mine-sweeping off Tsing Tao	11-11-14
	Name unknown	torpedoboat	——	By mine	
1878 669	Takachiho	schoolship	3,700	Torpedoed by German destroyer, S-90, off Tsing Tao	17-10-14

In addition to the above, five special service ships were sunk during the operations off Tsing Tao.

ITALIAN WARSHIP LOSSES

PAGE VOL. 41	PAGE VOL. 42	NAME	TYPE	TONNAGE	REMARKS	DATE
2137		Benedetto Brin	battleship	13,215	Blown up and sunk by an internal explosion	28- 9-15
1371		Amalfi	armored cruiser	9,958	Sunk by an Austrian submarine in the Adriatic	7- 7-15
1370		Garibaldi	armored cruiser	7,234	Torpedoed off Ragusa by Austrian submarine	18- 7-15
1370		Turbine	destroyer	325	Scuttled to avoid capture after an engagement with Austrian vessels in the Adriatic	24- 5-15
	308	Intrepido	destroyer	680	Sunk by mine in the Adriatic	17-12-15
		5-PN	torpedoboat	118	Torpedoed by Austrian submarine off Venice	26- 6-15
		17-OS	torpedoboat	118	Sunk by one of her own mines while mine-laying off Salvore	- 7-15
1370		Medusa	submarine	241-295	Torpedoed and sunk by an Austrian submarine	17- 6-15
		Nereide	submarine	221-315	Sunk by Austrian submarine in Adriatic	5- 8-15
	308	Re Umberto	transport	——	Sunk by mine in the Adriatic	17-12-15

LOSSES OF GERMANY AND HER ALLIES

GERMAN WARSHIP LOSSES

NAME	TYPE	TONNAGE	REMARKS	DATE
Yorck	armored cruiser	9,350	Ran on a German mine and sunk near Wilhelmshaven	3-11-14
Scharnhorst	armored cruiser	11,420	Sunk by English forces off the Falkland Islands	8-12-14
Gneisenau	armored cruiser	11,420	Sunk by English forces off the Falkland Islands	8-12-14
Friederich Karl	armored cruiser	8,858	No official report as to the loss of this vessel. Press reports state, however, that she was lost in the Baltic in	-12-14
Bluecher	armored cruiser	15,550	Sunk by British forces off the Doggerbank	24- 1-15
Prinz Adalbert	armored cruiser	8,858	Sunk by British submarine in Baltic	23-10-15
Mainz	protected cruiser	4,280	Sunk by British forces in the North Sea	28- 8-14
Koeln	protected cruiser	4,280	Sunk by British forces in the North Sea	28- 8-14
Ariadne	protected cruiser	2,618	Sunk by British forces in the North Sea	28- 8-14
Hela	protected cruiser	2,003	Sunk by British submarine E-9, in North Sea	13- 9-14
Augsburg	protected crusier	4,280	By gun fire	7- 8-14
Emden	protected cruiser	3,592	Sunk by Australian cruiser Sydney in Indian Ocean	9-11-14

PAGE VOL. 41	PAGE VOL. 42	NAME	TYPE	TONNAGE	REMARKS	DATE
262, 666, 1880, 2153		Leipzig	protected cruiser	3,200	Sunk by English forces off the Falkland Islands	8-12-14

1566		Augsburg	protected cruiser	4,280	By gun fire	7- 8-14
262, 666, 1880		Emden	protected cruiser	3,592	Sunk by Australian cruiser Sydney in Indian Ocean	9-11-14
262, 666, 1880, 2153		Leipzig	protected cruiser	3,200	Sunk by English forces off the Falkland Islands	8-12-14
276, 673, 1386		Nurnberg	protected cruiser	3,396	Sunk by English forces off the Falkland Islands	8-12-14
1387		Dresden	protected cruiser	3,592	Sunk by British cruisers in Pacific	14- 3-15
270, 670, 1388	667	Koenigsberg	protected cruiser	3,340	Sunk by English forces in Rufiji River	11- 7-15
2135	306	Undine	protected cruiser	2,672	Sunk by British submarine in the Baltic	7-11-15
	304	Bremen	protected cruiser	3,300	Sunk by submarine in the Baltic	17-12-15
1732		——	two light cruisers	——	Gulf of Riga	17- 8-15
1566		Magdeburg	small cruiser	4,478	Ran ashore in fog in Baltic and blown up by her own crew after an engagement with Russians	27- 8-14
283		Geier	small cruiser	1,630	Interned in Honolulu	8-11-14
	677	Karlsruhe	small cruiser	4,822	No official report by any of the belligerents as to this vessel's destruction. Press reports state she was, however, blown up by an internal explosion while cruising in the Atlantic Ocean	-11-14
1860		V-187	destroyer	689	Sunk by British forces in the North Sea	28- 8-14
1869		S-115	destroyer	413	Sunk by English destroyers in North Sea	17-10-14
1869		S-117	destroyer	413	Sunk by English destroyers in North Sea	17-10-14
1869		S-118	destroyer	413	Sunk by English destroyers in North Sea	17-10-14
1869		S-119	destroyer	413	Sunk by English destroyers in North Sea	17-10-14
1878	669	S-90	destroyer	396	Driven ashore and wrecked by her own crew off Tsing-Tao after having torpedoed the Japanese ship Takachiho	20-10-14
270		Taku	destroyer	276	Sunk by Germans in Kiao-Chau Bay before surrendering Tsing-Tao to Allies	7-11-15
250		S-124	destroyer	463	Accidentally rammed and sunk by a merchant vessel in Baltic	22-11-14
		V-186	destroyer	750	By gun fire	
		S-106	destroyer	675	By gun fire	
1861		S-126	destroyer	487	By submarine	6-10-14
1730		G-196	destroyer	689	Sunk by British submarine in North Sea	26- 7-15
1726		——	destroyer	——	Announced by France as having been sunk by two French torpedoboats off the Belgian coast	22- 8-15
		——	destroyer	——	Reported sunk by the Russians in the Baltic	19- 8-15
		——	destroyer	——	Reported as sunk by British submarine E-19 between Denmark and Sweden. Not confirmed	14-10-15
		——	destroyer	——		
		S-116	torpedoboat	477	Sunk by English submarine E-9 in the North Sea	6-10-14
		A-2	torpedoboat	about 150	Sunk by British destroyers in North Sea	1-15-15
		A-6	torpedoboat	about 150	Sunk by British destroyers in North Sea	1-15-15

GERMAN WARSHIP LOSSES—Continued

PAGE VOL. 41	PAGE VOL. 42	NAME	TYPE	TONNAGE	REMARKS	DATE
		——	torpedoboat	——	Officially announced by Russia as having been blown up by mine	30- 6-15
		——	torpedoboat	——	Announced by German Admiralty as sunk by mines in the Baltic	19- 8-15
		——	torpedoboat	——	Announced by German Admiralty as sunk by mines in the Baltic	19- 8-15
		——	torpedoboat	——	Sunk by submarine in the Baltic	17-12-15
1732		——	eight torpedoboats	——	Gulf of Riga	17- 8-15
		——	torpedoboat	——	Collision, Baltic	15-10-15
1568		U-15	submarine	about 450	Sunk by British cruiser Birmingham	10-10-14
250		U-18	submarine	——	Destroyed by the English destroyer Garry off Scotch coast	23-11-14
2132	306	U-8	submarine	246-295	Sunk by British destroyers	4- 3-15
		U-51	submarine	——	Sunk, Black Sea	17- 7-15
		U-12	submarine	246-295	Rammed and sunk by the British destroyer Ariel	10- 3-15
1009		U-29	submarine	——	Announced as sunk by British forces. Loss admitted by German Admiralty	26- 3-15
		U-14	submarine	about 300	Sunk by British forces about	8- 6-15
		U-	submarine	——	Officially announced by French as having been sunk in the English Channel by French squadron	4- 7-15
1729		U-27	submarine	840-890	Announced by German Admiralty as missing	10- 8-15
		——	submarine	——	Announced by English Admiralty as having been sunk by a British aeroplane off Belgian coast. Denied by Germany	20- 8-15
	1040	U-35	submarine	——		
		——	submarine	——	Reported as having run ashore near Riga in the Baltic and probably lost. Not confirmed by Germany	19- 8-15
		U-	submarine	——	Interned in Holland. Reported as being the U-8, but this vessel had been officially reported as having been sunk by the British	
		U-	submarine	——	Reported by British Admiralty as having been sunk by a British seaplane off Belgian coast	27-11-15
648		U-3	submarine	——	Rammed	9- 8-14
		Moewe	gunboat	640	Sunk by her own crew at Dar-es-Salam when English vessels appeared	14- 8-14
		Wissman	gunboat	about 300	Captured by English on Lake Nyasa	20- 8-14
		Planet	gunboat	640	Sunk by her own crew at Yap Island on approach of Japanese fleet	7-10-14

270	669	Cormoran	gunboat	1,604	Sunk by Germans in Kiao-Chau Bay before surrendering Tsing-Tao to Allies	7-11-15
270	669	Iltis	gunboat	886	Sunk by Germans in Kiao-Chau Bay before surrendering Tsing-Tao to Allies	7-11-15
270	669	Tiger	gunboat	886	Sunk by Germans in Kiao-Chau Bay before surrendering Tsing-Tao to Allies	7-11-15
270	669	Luchs	gunboat	886	Sunk by Germans in Kiao-Chau Bay before surrendering Tsing-Tao to Allies	7-11-15
270	669	Jaguar	gunboat	886	Sunk by Germans in Kiao-Chau Bay before surrendering Tsing-Tao to Allies	7-11-15
		Tsing-tau	gunboat	168	Interned, China	17- 8-14
		Vaterland	gunboat	168	Interned, China	17- 8-14
		Prince Adalbert	auxiliary cruiser	6,030	Captured by British cruiser	- 8-14
		Sudmark	auxiliary cruiser	5,113	Captured by British cruiser	15- 8-14
1578		Hedwick von Kaiser Wilhelm der Grosse	auxiliary cruiser	13,952	Sunk by British cruiser Highflyer	27- 8-14
		Bethania	auxiliary cruiser	7,548	Captured by British cruiser	7- 9-14
		Spreewald	auxiliary cruiser	3,899	Captured by British cruiser	12- 9-14
1584		Cap Trafalgar	auxiliary cruiser	18,710	Sunk by British auxiliary cruiser Carmania	14- 9-14
		Max Brock	auxiliary cruiser	4,579	Captured by British cruiser	- 9-14
1729		Itolo	auxiliary cruiser	299	Sunk by French gunboat at Cameroon	24- 9-14
		Rhios	auxiliary cruiser	150	Sunk by French gunboat at Cameroon	24- 9-14
		Soden	auxiliary cruiser	150	Captured by English cruiser off Cameroon River	1-10-14
		Gneisenau	auxiliary cruiser	8,185	Sunk by Belgians prior to evacuation of Antwerp	8-10-14
		Graecia	auxiliary cruiser	2,753	Captured by an English cruiser	10-10-14
		Markomannia	auxiliary cruiser	4,505	Sunk by British cruiser in Indian Ocean	16-10-14
		Navarra	auxiliary cruiser	5,794	Sunk by English auxiliary cruiser in Atlantic	11-11-14
		Greif	auxiliary cruiser	——	——	
		Eleonore Woermann	auxiliary cruiser	4,624	Sunk by Australian cruiser Australia	6- 1-15
1386		Macedonia	auxiliary cruiser	4,347	Captured	30- 4-15
		——	auxiliary cruiser	——	Reported as sunk in the Baltic in	- 8-15
653		Greif	auxiliary cruiser	1,165	Sunk in battle, North Sea	29- 2-16
		Friedrich	converted cruiser	8,865	Interned in Norfolk	7- 4-15
986		Kronprinz Wilhelm	converted cruiser	14,705	Interned in Norfolk	29- 4-15
252		Berlin	converted cruiser	17,324	Interned in Norway	16-11-14
		Patagonia	converted cruiser	——	Seized by Argentina, violation of neutrality.	
		Eber	converted cruiser	1,000	Interned at Bahia	- 9-14
282		Kormoran II	converted cruiser	3,508	Interned at Guam	15-12-14
		Kingani	armed merchant vessel	——	Captured by the British on Lake Tanganyka	
		Wissman	gunboat	about 300	Captured by English on Lake Nyasa	20- 8-14
		Planet	gunboat	640	Sunk by her own crew at Yap Island on approach of Japanese fleet	7-10-14

GERMAN WARSHIP LOSSES—Continued

PAGE VOL. 41	PAGE VOL. 42	NAME	TYPE	TONNAGE	REMARKS	DATE
1566		Königin Luise	minelayer	2,163	Sunk by English destroyer in North Sea	5- 8-14
		Rufin	minelayer	——	Sunk by Germans in Kiao-Chau Bay before surrendering Tsing-Tao to Allies	7-11-15
		——	minelayer	——	Reported by the French to have been captured outside of Havre disguised as a French collier	
1368, 1734		Albatross	minelayer	2,165	Sunk by Russians in Baltic. Reported as having been raised and interned in Sweden	2- 7-15
1729		Meteor	minelayer	3,613	Sunk by her own crew after attempting to escape from British forces in the North Sea	8- 8-15
		Karnac	auxiliary transport	4,437	Interned in Chile	11-14
1885		Comet	auxiliary sailing cruiser	977	Captured by Australian forces	18-10-14
	304	Bunz	patrol boat	——	Lost in Baltic	17-12-15
986		Prinz Eitel Locksun	naval tender	1,020	Interned in Honolulu	8-11-14
1364		Ophelia	——	1,153	Captured by English cruiser in the North Sea. English claim this vessel to be an auxiliary cruiser, while Germany claims her to be a hospital ship	17-10-15

In addition to the above, there seems to be no doubt but that a great number of German submarines have been destroyed around the British Isles and possibly also in the Mediterranean and near the Dardanelles. The exact number of German submarines sunk during this war is not known, although the press state this number to be at least 50 and possibly as many as 70.

AUSTRIAN WARSHIP LOSSES

1574		Zenta	cruiser	2,264	Sunk by French fleet off Antivari	16- 8-14
270	669	Kaiserin Elizabeth	cruiser	3,937	Sunk by her own crew at Tsing-Tao	7-11-14
	307	——	cruiser, Novara type	3,384	Torpedoed	13- 1-16
	307	Triglav	destroyer	787	Sunk by gun fire in Adriatic	29-12-15
	307	Lika	destroyer	787	Sunk by mine in Adriatic	29-12-15
1584		No. 19	torpedoboat	78	Struck by a mine and sank at entrance to Pola	18- 8-14
		——	torpedoboat	——	Sunk by mine in Adriatic	
		——	torpedoboat	——	Sunk by mine in Adriatic	
		——	submarine	——	Sunk by an Italian destroyer	17- 5-15
		U-18	submarine	685-860	Reported by France to have been sunk by a French aeroplane in the Adriatic	1- 7-15
1735		U-12	submarine	——	Torpedoed and sunk by an Italian submarine in the upper Adriatic	12- 8-15

		U-3	submarine	233-295	Sunk by French destroyer Bisson	13- 8-15

1735	U-12	submarine	——	Torpedoed and sunk by an Italian submarine in the upper Adriatic	12- 8-15

1734	U-3	submarine	233-295	Sunk by French destroyer Bisson	13- 8-15
——	——	submarine	——	Gun fire, French fleet	
	U-11	submarine	860	Sunk by aeroplane	1- 7-15
——	——	gunboat	——	Sunk, Adriatic	24- 5-15
	Beethoven	training ship	——	Struck a mine and foundered	17-12-14
	Temes	river monitor	433	Struck a mine and sank off Shabatz	23-10-14
661	Elektra	hospital ship	——	Torpedoed, Adriatic	18- 3-16

TURKISH WARSHIP LOSSES

260	Messudyeh	battleship	10,000	Sunk by British submarine B-11 in the Dardanelles	14-12-14
	Kheyr-Ed-Din	battleship	9,900	Torpedoed by British in the Sea of Marmora	9- 8-15
1375	Mejidieh	cruiser	3,330	Sunk by Russian mine in the Gulf of	
	Yadikar Nilet	destroyer	610	Sunk by a British submarine	- 5-15
1757	Barbarossa				
1757	316 Yar Hissar	destroyer	284	Sunk by British submarine in the Sea of Marmora	3-12-15
	Demir Hissar	torpedoboat	97	Stranded and interned at Chios	17- 4-15
1019	Dhair Hissar	torpedoboat	97	Driven ashore, Greece	17- 4-15
	317 Burak Reis	gunboat	502	Scuttled to avoid capture	31-10-14
				Odessa	3- 4-14
1376	Pelenk-I-Derih	gunboat	886	Sunk in the Sea of Marmora by British submarine	24- 5-15
	Marmaris	gunboat	492	Sunk by British in Tigris River	1- 6-15
1376, 1757	Berk-i-Satvet (type)	gunboat	725	By mine near Dardanelles	29- 4-15
	317 Issa Reis (type)	gunboat	500	Scuttled	1-11-14
	Doruk Reis	gunboat	502	Officially reported by Petrograd as sunk in Black Sea	10-12-15
	Malatia	gunboat	210	Officially reported by Petrograd as sunk in Black Sea	10-12-15
	Nagara	transport	——	Sunk by British submarine in the Sea of Marmora	- 5-15
1376	——	three transports with troops	——	Sunk by Russian warships	
2142	Carmen	transport	4,424	Submarine, Marmora	24-10-15
	316 Rechid Pasha	transport	8,000	Submarine, Marmora	-12-15
	Bezemialen	troop ship	——	Sunk, Black Sea	14-11-14
	Bachriachmar	troop ship	——	Sunk, Black Sea	14-11-14
	Midiat Pasha	troop ship	——	Sunk by submarine	6- 9-15

In addition to the above, other Turkish men-of-war may have been destroyed around the Dardanelles and in the Black Sea. Reports from England, Russia and Turkey in regard to these operations are so conflicting that it is impossible to accurately state what Turkish vessels have been destroyed, especially transports and supply ships.

NORTH SEA

THE DOGGER BANK ENGAGEMENT.—The *Revista Marittima* devotes 58 pages of its January issue to a review of the battle cruiser action in the North Sea, including official reports and private records, about 30 pages of discussion, illustrations of all the ships engaged, and diagrams. The article concludes as follows: The Dogger Bank engagement, in our opinion, was an indubitable victory for the British, and would have been more complete in the Nelsonian sense ("Had 10 ships been taken and the 11th escaped, we being able to get at her, I should never consider it well done"), if the flagship had not been forced to leave the formation. Admiral Beatty, who with much wisdom and energy had initiated and brought the action to a favorable stage, would certainly not have broken it off so soon, and the consequences for the enemy would surely have been more serious, for the *Derfflinger* was at the time in a precarious condition. The victory, in other respects, was determined by larger caliber guns and superior speed.

The numerical superiority of the British could not be made to contribute its full weight to the outcome of the engagement on account of the inferior speed of the *New Zealand* and *Indomitable*.

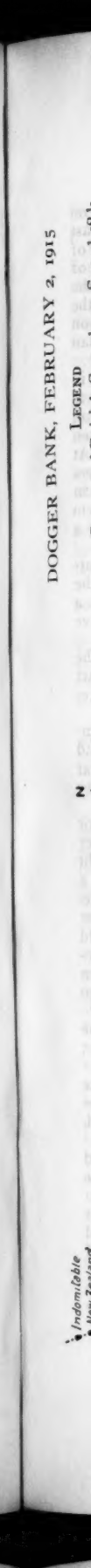
In simple terms, the action was a long range engagement between the *Lion, Tiger,* and *Princess Royal* on one side, and the *Seydlitz, Moltke,* and *Derfflinger* on the other. The *New Zealand* and *Indomitable* fired only on the *Blücher,* and here the British preponderance was brought to bear; but it was superfluous, since the *Blücher* was already in bad shape from the fire of the *Lion* and *Tiger*.

Comment.—The accompanying sketch is based on the last report of Admiral Beatty and should be taken as tentative and approximate, intended more than anything else to show in connection the various phases of the action up to the moment when the *Lion* was forced to drop out of formation —practically the termination of the engagement.

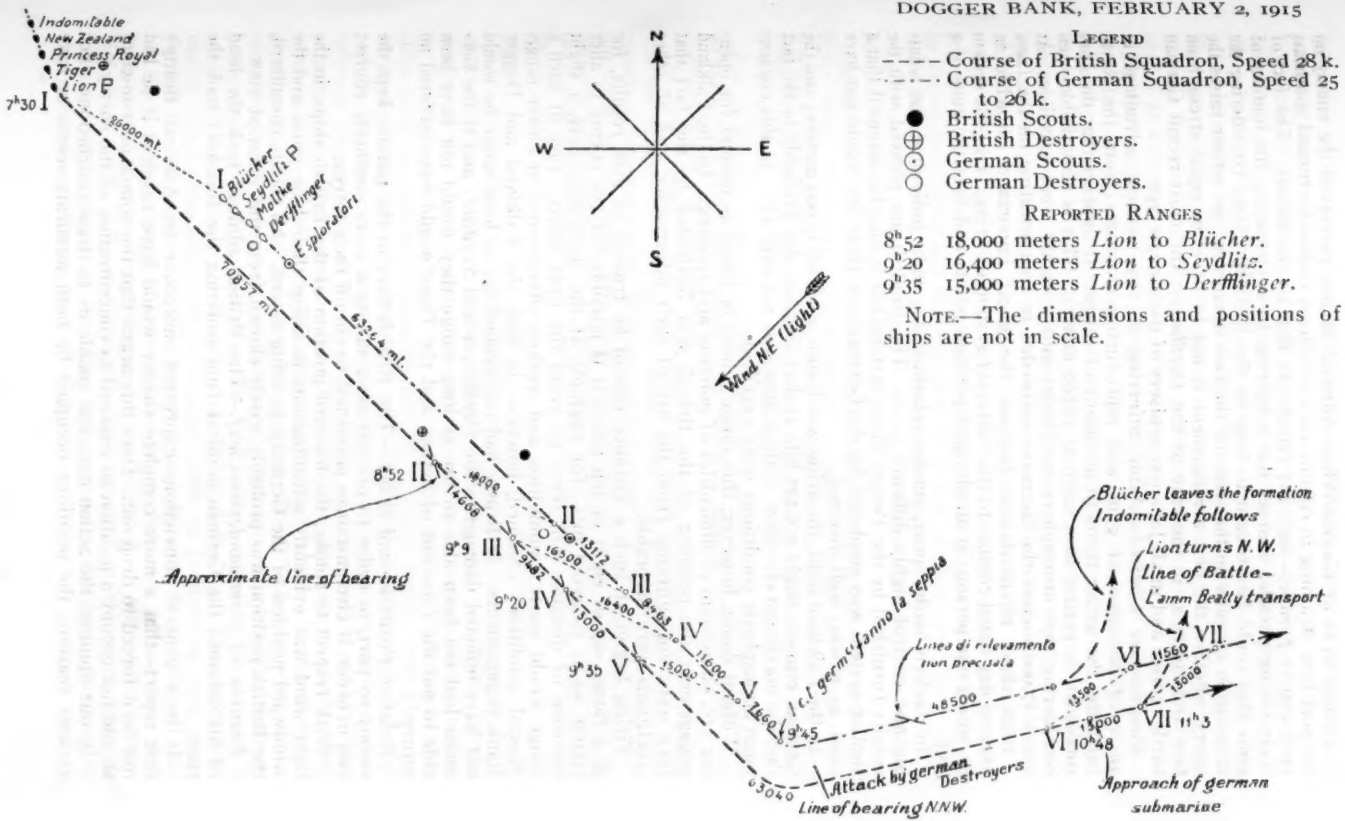
The sketch assumes an average speed of 28 knots for the faster British cruisers, over a course of about 100 miles; the speed certainly was not greater. On the basis of this reasonable assumption, and the ranges given in Admiral Beatty's report, the average speed of the German cruisers during the chase was between 25 and 26 knots—probably due to the fact that Admiral Hipper did not at the beginning of the action decide to abandon the *Blücher* and hence did not at once push the other three cruisers to their highest speed. (The writer here points out that the British ships both in this and in the Falkland engagement developed better speed than in their trials. He points out further that the German battle cruisers, except the *Blücher,* were credited in all the naval annuals with a speed superior or equal to that of the British.)

Speed of the Two Squadrons.—It may be seen at once, from the composition of the German squadron, that the *Blücher's* inferior speed, aside from weaker armor and armament, made her an element of weakness, and a sure victim for the enemy. It was necessary either to reduce the speed of the squadron to hers, and thus fail to utilize the most valuable element in the type of ship of which the squadron was composed, or abandon her to the enemy. The *Von der Tann* (28 knots) would have figured in the line to much better advantage; and the report seems not unlikely, therefore, that in the preceding German raid of December 11 the *Von der Tann* was damaged by an English shore battery.

In case of retreats, this disparity of speed in the German squadron was a more serious weakness than it would have been in pursuit. Yet in view of the British naval superiority it would seem that the likelihood of being attacked by superior force might have been foreseen. Obviously it is of greatest importance, in warfare against a strongly superior navy, to form squadrons with a view of the possibility of retreat, and to make them so far as possible homogeneous. Yet the Blücher seems to have been included in all the preceding raids on the English coast.



DOGGER BANK, FEBRUARY 2, 1915



LEGEND

- Course of British Squadron, Speed 28 k.
- Course of German Squadron, Speed 25 to 26 k.
- British Scouts.
- British Destroyers.
- German Scouts.
- German Destroyers.

REPORTED RANGES

8h52	18,000 meters	*Lion* to *Blücher*.
9h20	16,400 meters	*Lion* to *Seydlitz*.
9h35	15,000 meters	*Lion* to *Derfflinger*.

NOTE.—The dimensions and positions of ships are not in scale.

Arrangement of Guns.—When Admiral Beatty perceived the enemy on his port bow steaming in column on a southeast course he turned southeast on a course *parallel*—says his report—to that of the enemy. The fact of their taking parallel courses has a bearing in determining the number of guns that could be brought to bear by the British. After considering the disposition of guns on the ships of the two squadrons, the writer raises the query whether the best arrangement is not to have an equal strength on bow and stern, as in the case of the *Derfflinger*, the most recent German battle cruiser and in all Japanese cruisers of the *Kongo* type.

Range—Fire Control.—After referring to the German advantage in *angle of elevation* of guns and reproducing diagrams from the Naval Institute, the writer turns to questions of range. It appears that the *Lion* succeeded in getting in a salvo at 18,000 meters. This is remarkable, even considering that atmosphere conditions and visibility were excellent. At about 17,000 meters the Germans succeeded in concentrating on the *Lion*.

Both these circumstances indicate the great importance attached in present day naval combat to the "director system of firing," *i. e.*, the system by which one person, in an elevated position points and fires the guns of a ship.

In modern battle, spray, smoke, splashes, etc., make individual gun pointing and control highly difficult. . . . . The English are pleased with the results furnished by the Persey Scott system, but it may be assumed that a similar system was employed by the Germans, or their fire would not have been, as it was, well directed.

In the Falkland fight, the firing was begun at about 15,000 meters; and the German cruisers could not get hits at that distance, due probably to the fact that the maximum elevation of their guns was not over 15°. In this engagement atmospheric conditions were excellent.

Without doubt, however, this range cannot be taken as normal for opening fire, on account of difficulties of pointing and spotting. In the Falkland engagement the pointing of the British was facilitated by the fact that they were not suffering from the fire of their adversaries, and all other conditions were favorable.

Firing begun at such a distance cannot be trusted to give results, for at a range say of eight or ten miles, it is possible for the enemy to alter course so as to avoid hits—for example, if the shots are short, a slight increase of distance will serve to avoid the next salvo. Fire at such a range would waste ammunition and weaken effectiveness at closer range. Special conditions obtained, however, in both the Falkland and Dogger Bank engagements. If Beatty had not opened fire at long range he would not have inflicted damage to the *Derfflinger* and *Seydlitz*; and if the Germans had not been able to fire at long range they would not have been able to put the *Lion* out of action, and the *Tiger* would have suffered no injury.

Relative Positions and Wind.—The British fleet in the pursuit kept the enemy to port, in order to prevent their taking a more southerly course; and in order, if circumstances permitted, to cut off their retreat.

With respect to smoke, the leeward position of the British ships, in the light wind was evidently advantageous in firing their bow guns, and the windward position of the Germans in firing astern. All things considered, the British position was probably wisely chosen from this point of view.

Position of Commander-in-Chief.—The British admiral took the head of his column; the German admiral (not counting the *Blücher*) took the rear.

It is a general conviction—expressed moreover in Admiral Beatty's first report—that a more complete victory would have resulted if he had not been forced to drop out. Does this argue that the commander-in-chief should not occupy a position so exposed to concentration of the enemy?

In our opinion, the action does not enable us to draw conclusions. For various reasons, the positions occupied by both admirals seems to have

been more or less fortuitous, brought about by the exigencies of flight and pursuit at utmost speed.

Scouts and Auxiliaries.—In an engagement at high speed the scouts and destroyers could scarcely attempt offensive action—certainly not those of the pursuer. They might be used to give the *coup de grace* to a ship out of action, but in the case of the *Blücher,* the *Indomitable* was employed. This was perhaps because the speed of the *Indomitable* was not sufficient to make her useful in the chase, or perhaps because the destroyers were needed as a protection against submarines.

The German scouts—four against six British, and weaker in armament—kept the head of the formation. The English scouts, according to the testimony of the commander-in-chief, did excellent scouting and information service, which enabled him to bring on the engagement and to take a favorable position. In the pursuit the British scouts evidently took and kept a position astern and to the left of the German line, favorable for watching the enemy and attacking units separated from the squadron.

The German destroyers, when the action was well under way, twice attempted an attack on the enemy cruisers—the first time being driven off by British destroyers and the second time by fire of *Lion* and *Tiger.* The latter ships, however, were, it appears, not forced out of their course.

Later the *Meteor,* approaching to attack the *Blücher,* was hit, and had to be aided by the destroyer *Liberty.*

Submarines.—At 10.54 German submarines were reported on the starboard bow. The *Lion* turned rapidly to port to avoid the attack, thus changing the range. This may have worked to the disadvantage of both sides, but, in view of the damage already sustained by the German squadron, it was probably for them a welcome respite.

End of the Engagement.—The engagement ended at a distance of from 40 to 60 miles from Heligoland. The German reports give the distance as 70 miles WNW. of that island.

The first English reports state that the reason for giving up the chase was the danger of running into mine fields and submarines. The later report of Admiral Beatty is silent on this point. It may be assumed that the order to withdraw was given by Admiral Moore, who was then in temporary command. But the silence of the commander-in-chief suggests the possibility that he did not fully approve of the order.—*Revista Marittima,* January, 1916.

RAID ON LOWESTOFT.—The activity which has been observed on the part of the German Navy since the beginning of the year, as shown by the sinking of the *Arabis* and other incidents, was carried a stage further on Tuesday morning (April 25). On that day battle cruisers and other ships made a raid on Lowestoft, similar to those which took place on November 3 and December 16, 1914, upon Yarmouth, Scarborough, Whitby, and the Hartlepools. The damage caused was comparatively trifling, considering the strength of the German force, and the fact that only four persons were killed compares favorably with the last assault of the kind, when over 100 people were killed in Scarborough alone. No naval losses of ships occurred, and the casualties among officers and men were slight, being unofficially reported as 25 killed and wounded. The available German battle cruisers include, probably, the *Hindenburg,* launched on August 1, 1915, and the *Lützow, Derfflinger, Seydlitz,* and *Moltke.* The three last-named were in the action off the Dogger Bank on January 24, 1915, when the *Blücher* was sunk. On Wednesday it was reported from Vlieland that the German squadron had been sighted from there on the previous day, going eastward, apparently returning from England. It was stated to consist of 20 ships. Great Yarmouth was attacked at the same time as Lowestoft, but only one building was seriously damaged there.—*The Army and Navy Gazette,* 29/4.

ADMIRALTY STATEMENTS.—The official statements issued by the Admiralty were as follows:

1. About 4.30 on Tuesday morning the German battle cruiser squadron, accompanied by light cruisers and destroyers, appeared off Lowestoft. The local naval forces engaged it, and in about 20 minutes it returned to Germany, chased by our light cruisers and destroyers. On shore two men, one woman, and a child were killed; the material damage seems to have been insignificant. So far as is known at present two British light cruisers and a destroyer were hit, but none were sunk.

2. During the operations against the German battle cruiser squadron (which appeared off the East Coast on Tuesday morning), two Zeppelins were pursued by naval land machines over 60 miles out to sea. Bombs and darts were dropped, but apparently without serious effect. An aeroplane and a seaplane attacked the German ships off Lowestoft, dropping heavy bombs. Four enemy submarines were also attacked by bombs. One seaplane came under heavy fire from the hostile fleet, but the pilot, although seriously wounded, succeeded in bringing his machine safely back to land. It is regretted that one pilot is reported missing. He ascended during the course of the Zeppelin raid earlier in the morning, and appears from reports to have attacked a Zeppelin off Lowestoft at about 1.05 a. m. He has not been heard of since.

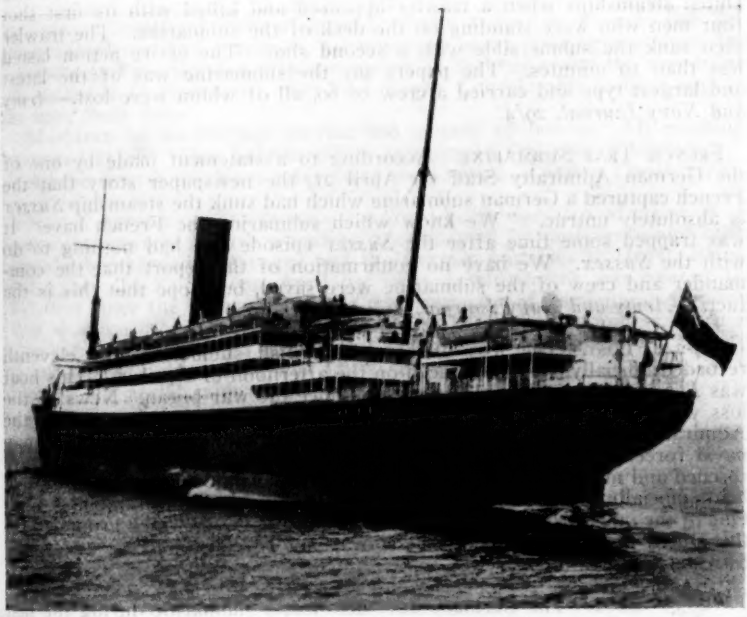
A German *communiqué* issued on Wednesday claimed that a British destroyer and two patrol boats were sunk in the raid, one of the latter being the trawler *King Stephen*, the crew of which were made prisoners. A bombardment of the "fortifications and important military buildings at Great Yarmouth and Lowestoft" was said to have been carried out "with good success."—*Army and Navy Gazette*, 29/4.

ZEEBRUGGE BOMBARDED.—On Monday morning numerous monitors, destroyers, and large and small craft resumed offensive operations off Zeebrugge. The German official account said the ships "were apparently looking for mines and placing buoys to indicate places for bombardment. Three German torpedo-boats which were near the Flemish coast made repeated attacks on the monitors, destroyers, and other vessels, repulsing them and hindering their action. In spite of the heavy counter-action of the enemy, our torpedo-boats were uninjured, and the English vessels afterwards left the Flemish coast." There has been no British official account of this engagement, but Dutch reports indicate that the damage to the Zeebrugge works was "enormous," and that three German torpedo-boats and (according to one account) a submarine were hit.—*Army and Navy Gazette*, 29/4.

"PENELOPE" DAMAGED.—"A despatch from Rotterdam states that the crew of the Dutch steamship *Berkelstrom*, which was sunk on April 23, declared on their return from England that they were in the port of Harwich when the British cruiser *Penelope* was towed into the harbor. The cruiser was found, after the battle of Lowestoft, to have been so badly damaged that it was impossible to repair her, members of the crew asserted."

The British cruiser *Penelope* is a vessel of 3600 tons, 410 feet long, built at Barrow in 1914. Her main armament consists of two 6-inch and six 4-inch guns, with four torpedo-tubes. She is of the *Arethusa* class, the *Arethusa* herself having been sunk last February after striking a mine off the English east coast. A German Admiralty report on April 27 said a British cruiser of the *Arethusa* class had on the day of the Lowestoft fight been struck with a torpedo from a German submarine, and the German official account of the Lowestoft affair declared a serious fire was observed to have broken out on one of the British cruisers that had engaged the raiding German fleet.—*N. Y. Herald*, 4/5.

FIGHTING MERCHANTMEN. *Action Between Greif and Alcantara.*—The *Greif* was a boat of some nine or ten thousand tons, heavily armed with disguised 6-inch guns and, apparently, torpedo-tubes. The ship adopted the dressing, even to the colors painted on her hull, of a Norwegian merchantman. She left her home port towards the end of February. On the 29th of that month she was between Scotland and the Faroe Islands. Here she was challenged by the British armed merchantman *Alcantara,* a Royal Mail vessel of some 16,000 tons, completed at Belfast just before the outbreak of war. An extremely stiff fight ensued at very close range, so close, in fact, that at one time it appeared likely that hand-to-hand fighting on the enemy's decks would be possible. It is said that the German gunnery was bad and did little damage to our ship. On the other hand, the British



BRITISH ARMED MERCHANT CRUISER "ALCANTARA," 15,831 TONS, SUNK IN THE NORTH SEA IN AN ENGAGEMENT WITH THE GERMAN CRUISER "GREIF"—THE "ALCANTARA" WAS BUILT IN 1914 FOR THE RIVER PLATE SERVICE OF THE ROYAL MAIL STEAM PACKET CO.—THE "GREIF," WHICH ALSO SANK DURING THE ENGAGEMENT, WAS A CRUISER OF 2028 TONS DISPLACEMENT, BUILT IN 1886 AND DISGUISED AS A NORWEGIAN TRAMP—SHE OPENED FIRE WITH THE NORWEGIAN COLORS PAINTED ON HER SIDE—OF HER COMPLEMENT OF MORE THAN 300, FIVE OFFICERS AND 115 MEN WERE SAVED AND TAKEN PRISONERS—THE "ALCANTARA" LOST FIVE OFFICERS AND 69 MEN

guns, although inferior in power to the enemy's, raked the *Greif* from stem to stern, set her on fire aft, and reduced her to a foundering condition. Just as complete victory appeared certain, a wild shot knocked out the *Alcantara's* steering gear. Rendered helpless, she became an easy mark for a torpedo discharged from the sinking enemy. A British light cruiser and some destroyers were by this time rushing to the scene of action. These soon finished off the raider and rescued what remained of the crews

of the combatants. Both vessels were thus lost. The German prisoners numbered 120 out of a crew believed to have contained over 300. The British losses amounted to five officers and 69 men. For nearly a month, until, in fact, the 25th of March, our Admiralty suppressed the news of this engagement, for it was not thought desirable to inform the Germans of the loss of their "raider" before they found it out for themselves. The *Alcantara* was commanded by Captain T. E. Wardle, R. N. Her crew consisted very largely of naval reservists, naval volunteers, and specially entered mercantile hands.—*The Engineer*, 7/4.

TRAWLER SINKS SUBMARINE.—The destruction of a German submarine by a British trawler off the north coast of Scotland is described by Dutch newspapers. According to the accounts, the submarine had halted two Dutch steamships when a trawler appeared and killed with its first shot four men who were standing on the deck of the submarine. The trawler then sank the submersible with a second shot. The entire action lasted less than 10 minutes. The papers say the submarine was of the latest and largest type and carried a crew of 60, all of whom were lost.—*Army and Navy Journal*, 29/4.

FRENCH TRAP SUBMARINE.—According to a statement made by one of the German Admiralty Staff on April 21, the newspaper story that the French captured a German submarine which had sunk the steamship *Sussex* is absolutely untrue. "We know which submarine the French have. It was trapped some time after the *Sussex* episode and had nothing to do with the *Sussex*. We have no confirmation of the report that the commander and crew of the submarine were saved, but hope that this is the fact."—*Army and Navy Journal*, 29/4.

"E-22" LOST.—The loss of another British submarine, the eleventh recorded officially, was announced on the afternoon of April 27. This boat was *E-22*, a new vessel only completed since the war began. News of the loss was first communicated by the German wireless and accepted by the Admiralty. It appears that the boat was sunk on April 25 by German naval forces "in the southern waters of the North Sea." Two men were rescued and made prisoners. It is significant that nine of the eleven British boats officially reported as lost since the war began have been of the *E* type. One of the others was *D-5*, and the identity of the vessel which grounded off the Dutch coast on January 20 last was not revealed.—*Army and Navy Gazette*, 6/5.

"U-35" LOST.—The Germans have also lost a submarine during the last few days, and just as the sinking of *E-22* was first reported in their wireless and accepted by our Admiralty, so the loss of this boat was announced by the British authorities on April 28 and confirmed on the 30th by the Chief of the Naval Staff in Berlin. The German boat was lost off the east coast on April 27. One officer and 17 men of the crew surrendered, and were made prisoners. The number of the boat is given unofficially as *U-35*, although other accounts refer to it as *UC-5*.—*Army and Navy Gazette*, 6/5.

SCHLESWIG-HOLSTEIN RAIDED.—An attack by British seaplanes was delivered yesterday morning upon the German airship sheds in Schleswig-Holstein, east of the Island of Sylt. The seaplanes were convoyed to their rendezvous close to the German coast by an escorting force of light cruisers and destroyers under Commodore Tyrwhitt. Three of the seaplanes which took part in the attack are missing.—*Army and Navy Gazette*.

BRITISH LOSE "MEDUSA"; GERMANS LOSE ONE DESTROYER AND TWO TRAWLERS.—A supplementary statement was issued by the Admiralty on March 28, as follows:

All ships employed in the operations on the German coast have now returned to their ports, except H. M. S. *Medusa,* which ship, as was feared, sank, after all her crew had been taken off, in very bad weather, by H. M. t. b. d. *Lassoo* without any casualty—a fine piece of seamanship. Our destroyers, while dealing with the enemy patrol vessels, were themselves attacked by enemy aircraft, but received no damage of any kind. The following prisoners were rescued from the enemy patrol trawlers, which were previously reported sunk by our ships—viz., four from trawler *Otto Rudolf,* 16 from trawler *Braunschweig.* On Saturday night (25th) a division of German destroyers was encountered by our light cruisers; one of these destroyers was rammed and sunk by H. M. S. *Cleopatra,* none of her crew being saved.—*Army and Navy Gazette,* 1/4.

SIXTY-FIVE MACHINES IN ALLIED AIR RAID.—In the early hours of this morning a combined force of approximately 50 British, French, and Belgian aeroplanes and seaplanes, accompanied by 15 fighting machines, left and attacked the German seaplane station at Zeebrugge and the aerodrome at Houltade (? Houttave), near Zeebrugge. Considerable damage appears to have been done.

Machines on an average carried 200 pounds of bombs. All machines returned safely. One Belgian officer is reported seriously wounded.

All the British machines referred to were naval.—*London Times,* 21/3.

NAVAL ATTACK ON ZEEBRUGGE.—An Amsterdam despatch of April 25 reports that several British warships, accompanied by destroyers and other vessels, bombarded Zeebrugge and the German batteries at Heyst, Blankenberghe and Knocke on April 24. The bombardment was one of the heaviest since the beginning of the war, and also of the longest duration. The damage done at Zeebrugge is said to have been enormous. British aircraft, it is said, threw bombs on German batteries. In connection with the Zeebrugge operations the official British communication issued concerning the aerial raids by the British air corps, aided by Belgians, says, on April 23, in spite of most inclement weather, a bombing attack was carried out by our naval aeroplanes upon an enemy aerodrome at Mariakerke. The machines were heavily fired on, but succeeded in returning safely. As far as could be observed, good results were obtained. One British fighting machine attacked an enemy aeroplane and it was last seen close to the ground and out of control. The morning of April 24 a further attack was carried out against the same objective in co-operation with our Belgian allies. A large number of bombs were dropped. A heavy fire was encountered by all of the machines. There were no British casualties. The results obtained appear to have been very good. The same day a British aeroplane attacked an enemy seaplane about five miles off Zeebrugge. The enemy pilot was killed. The machine dropped, the enemy observer falling out while the machine was still at a height of 3000 feet. The hostile seaplane crashed into the sea and sank.—*Army and Navy Journal,* 29/4.

PRINCE HENRY OF PRUSSIA IN SUPREME COMMAND.—The sea commanders have gone—Ingenohl and Pohl—and the supreme command has been given to Prince Henry of Prussia, who stands outside the ordinary naval cadre. A great student of naval policy, discussing this change, said: "Prince Henry of Prussia is no seaman; he has virtually no experience of the handling of great fleets. He has been given the chief command so that it may be under the direction of one who is not in any way associated with the policy of stagnation." There are those, and they are not a few, who argue that Germany knows she is beaten; that she believes that one of the conditions of peace will be the surrender of the fleet, and she would rather the fleet went down with colors flying, having inflicted the maximum damage, than tamely submit at the close of the war.—*United Service Gazette,* 11/5.

NEW FRENCH COMMAND.—An interesting new naval post in the channel and North Sea is reported to have been created by the French Ministry of Marine. A naval commander-in-chief has been appointed for the northern zone of the army. This command, which will have the direction of the new defence flotillas, will ensure a closer co-operation between the naval and military forces operating in Flanders.—*Army and Navy Gazette*, 1/4.

BLOCKADE DUTY PERFORMED LARGELY BY ROYAL NAVAL RESERVES.—The interview which Mr. Henry Suydam, the London correspondent of the *Brooklyn Daily Eagle*, has had with Rear Admiral Sir Dudley de Chair on the work of the allied blockade in the North Sea sheds light upon a little-known aspect of the navy's duty. Sir Dudley de Chair, who commanded the Tenth Cruiser (blockade) Squadron from August 4, 1914, to March 6, 1916, when he relinquished the command to become naval adviser to the new Minister of Blockade in matters of enemy trade, now gives the first authentic and reliable account of the machinery by which all oversea traffic between the outside world and Germany is intercepted. The two salient points brought out in his interview, it seems to us, are the increased difficulties of examining cargoes in modern vessels, and the arduous nature of the service demanded of officers and men in the patrol cruisers. Apart from ruses to elude the vigilance of examining officers, of which Sir Dudley mentions no less than eight classes, it takes from two to five days to sift the cargo to the bottom. In rough weather, it is impossible to do this at all at sea, as to open the hatches would mean wetting the cargo and shipping heavy seas. It would also be risky to begin to discharge an entire ship's cargo upon her own decks with bad weather likely to come on at any moment, but over and above this is the submarine menace, which makes it quite impossible. Even during the brief time required for the boarding officer to conduct his preliminary examination, Admiral de Chair points out, the neutral ship is almost invariably allowed to steam ahead at half-speed, while the patrolling cruiser slowly convoys her. Hence the necessity, recognized by neutrals, of bringing the merchantmen into port, where the inspection can proceed safely and expeditiously.

In regard to the second point we have mentioned, Admiral de Chair says very truly that blockade work is unspectacular and uninspiring, but exceedingly dangerous. He pays a glowing tribute to the officers and men under his command, whose work was consistently faithful and effective under conditions which held always the possibility, for 24 hours a day, of destruction by German mines and torpedoes. With an adequate sprinkling of Royal Navy men in command, the bulk of the blockade officers are drawn from the Royal Naval Reserve. This is a double advantage, because not only does it leave the majority of officers in the regular service free to supply the needs of the fighting fleet proper, but the Mercantile Marine officers are peculiarly fitted for blockade work, being accustomed to manifests and ships' papers and knowing how to make a quick, comprehensive, and judicial inspection of cargoes. Indeed, Sir Dudley de Chair declares that the basis of our blockade rests upon the ability and courage of the officers and men drawn from the Mercantile Marine. They have proved their worth under conditions of the most trying kind. The patrol ships are at sea for 50 days at a stretch before going into port for coal and provisions. They endure hazards from the weather as well as the enemy, and in mid-winter service in the North Atlantic is very severe. Like their comrades in the Grand Fleet, they are denied the inspiration of action with the enemy, and may patrol their beat for days and days on end without anything happening. The nation, indeed, owes a deep debt of gratitude to its merchant seamen.—*The Army and Navy Gazette*, 6/5.

ATTEMPT TO AID IRISH REVOLT.—The attempt of Germans, aided by some revolutionary Irishmen, to land an expedition in Ireland to aid in stirring

up a revolution there, resulted in failure. The official announcement for military reasons goes very little into details, and briefly says: "During the period between the afternoon of April 20 and the afternoon of April 21 an attempt to land arms and ammunition in Ireland was made by a vessel under the guise of a neutral merchant ship, but which in reality was a German auxiliary, in conjunction with a German submarine. The auxiliary sank and a number of prisoners were made, among whom was Sir Roger Casement."—*Army and Navy Journal*, 29/4.

NAVAL CO-OPERATION IN QUELLING IRISH REVOLT.—The navy was able to co-operate to good purpose with the army in suppressing the revolt in Dublin by the despatch of a gunboat to shell Liberty Hall from the River Liffey. This vessel had more success in its way than that which attempted to carry food supplies by river to Kut-el-Amara, but which unfortunately grounded when but a few miles from its destination.—*Army and Navy Gazette*.

BALTIC SEA

BRITISH SUBMARINE'S PRIZE.—A telegram from Frederikshaven states that the Norwegian steamer *Kong Inge*, from Christiania, arrived there this morning with an English prize crew consisting of six men on board.

On Saturday she was hailed off Falkenberg by an English submarine, which examined the ship's papers, put a prize crew on board, and gave the steamer orders to proceed to Leith. As the supply of coal was found to be insufficient, however, the vessel put in at Frederikshaven in order to obtain a fresh supply of coal.—*Reuter, London Times*, 21/3.

NEW GERMAN MINEFIELD.—It appears that a new German minefield is being placed along the Falsterbo reef. According to a message received from Malmö on February 19, the Falsterbo route will, after this new minefield has been sown off that place, be practically shut off from the sea, and sailing craft outside the minefield will, if there is an easterly wind, be unable to take shelter either at Falsterbo or Skanör. A Swedish paper states, however, that the new field "has no military value, because if a submarine slips through the sound the vessel's subsequent course is not laid along the coast, and especially not towards Falsterbo." But it has been stated that these mines will menace coastal navigation, as with a heavy sea some of them will drift into Swedish territorial waters.—*Army and Navy Gazette*, 26/2.

SUBMARINE OBSTRUCTIONS.—The *Norwegian Shipping Gazette* states that the German Navy has stopped the international passage south of the Sound, not merely by the usual mine obstructions, but also by steel nets designed to entrap British submarines on their way to the Baltic. Danish torpedo-boats have been carefully watching to see that the obstructions were not placed in Danish territorial waters.—*Army and Navy Gazette*, 22/4.

ADRIATIC SEA

MEASURES AGAINST GERMAN SUBMARINE BASES.—The activity of the submarines in the Eastern Mediterranean has necessitated a further move on the part of the Allies. It has been considered desirable to occupy certain bases in the archipelago for the purpose of dealing with the under-water menace in that region. An Italian paper stated not long since that a vast organization had been discovered at Corfu for supplying information and necessaries to the submarines. The best way of dealing with these pests is to stop their holes. Some of the islands, therefore, have been blockaded, a general search is being made, and Cephalonia has been occupied. The harbor of Argostoli will provide a central point at the entrance to the Adriatic, and Mitylene will no doubt provide another for a similar purpose

in the Ægean. Only by taking steps of this nature will it be possible to ensure a safe continuance of the traffic made necessary by our operations in the Eastern Mediterranean. The shelling of Smyrna, on the coast of Asia Minor, is probably connected with the same energetic measures which are now being taken to suppress the submarines in this part of the world.—*Army and Navy Gazette*, 15/4.

MEDITERRANEAN SEA

BATTLESHIP "RUSSELL" SUNK.—It was officially announced on the afternoon of April 27 that the battleship *Russell* had struck a mine on the previous day in the Mediterranean and sunk. The admiral, captain, commander, and 23 officers, with 676 men, were saved, and there were about 124 officers and men missing. On Sunday, what was described as "a private German report" was cabled from Copenhagen to the effect that the general opinion was that the *Russell* was not blown up by a mine, but was torpedoed by a German or Austrian submarine, since there were no mine dangers at all in the Mediterranean, minelaying being very difficult on account of the depth of the water. The *Russell* is the tenth British battleship lost in the war, and all of them, with the exception of the *Bulwark*, have been destroyed by torpedoes or mines. The *Russell*, launched at Jarrow in 1901 and completed in 1903, belonged to the *Duncan* class, and was of 14,000 tons and 19 knots speed, with an armament of four 12-inch and 12 6-inch guns.

SINKING OF THE "CARTHAGE."—The French liner *Carthage* belonging to the Cie Générale Transatlantique, built 1910, gross tons 4981, was torpedoed

THE ILLUSTRATION SHOWS THE FRENCH LINER "CARTHAGE" SINKING, AFTER BEING TORPEDOED ON JULY 4 LAST. THE VESSEL WILL BE SEEN ON THE LEFT OF THE PHOTOGRAPH GOING DOWN IN AN ALMOST PERPENDICULAR POSITION

and sunk by a German submarine on July 4, off Cape Helles. The following interesting account was sent us by an eye witness shortly after the event, but the details were not published while operations were still being conducted there. Our correspondent says: "The sinking of the *Carthage* could be plainly seen by the Turks at Kum Kale. I was standing at the door of my tent looking through my glasses at nothing in particular when

suddenly I saw a tremendous column of smoke and water go up from the port quarter of the *Carthage*, which immediately began to settle by the stern. Very shortly her stern was right under water and her bow began to rise until she was straight up with about a third of her length showing. As the water poured down her funnels there seemed to be a second explosion, but it was not the terrific bursting of boilers that one reads of in accounts of steamers sinking. Then she slid straight down into the sea. From first to last only four minutes elapsed, which makes the small loss of life—six men only—remarkable. Seventy-six men owed their lives to the rafts which were luckily lying alongside. When one considers the small loss of life and the fact that she had just finished unloading her cargo (shells, as it happened), the gain to the enemy was a very barren one."—*Marine Engineer and Naval Architect*, March, 1916.

ALLIED COMMAND.—The First Lord of the Admiralty, replying to a question on February 23, said that it would be inadvisable to state in detail the organization of the allied naval commands in the Mediterranean; but the general command is in the hands of the French commander-in-chief—at present Admiral d'Artige du Fournet; the command of the Adriatic and its approaches is in the hands of the Italian commander-in-chief—his Royal Highness the Duke of the Abruzzi; and other local commands are assigned to British officers. The best general indication of the work performed by the allied fleets in the Mediterranean, added Mr. Balfour, is the successful transport of large military forces to Salonika, Valona, and Egypt; the successful evacuation of the allied expedition from the Dardanelles; and last, but not least, the transportation of the Serbian Army from Albania—a result chiefly due to the ability and energy displayed by the Italian fleet.—*Army and Navy Gazette*, 4/3.

HOSPITAL SHIPS AT DARDANELLES.—Forty-nine hospital ships were employed in handling the casualties during the attack of the Allies upon the Dardanelles, according to reports received at the Navy Department. Some of the largest passenger liners were converted into hospital ships and the work that they did exceeded that of former wars. The hospital ship *Rewa* in two months handled 7424 patients; of these 507 submitted to major operations. An instance was given where the hospital ship *Soudan* took on board between 10 a. m. and 8 p. m. 430 patients.—*Shipping Illustrated*, 15/4.

"TARAS" RESCUED.—On Monday the Secretary of the Admiralty made the welcome announcement that 91 prisoners from H. M. armed boarding steamer *Tara*, who were captured on November 5, 1915, had been recaptured. The prisoners, who included Captain Rupert Gwatkin-Williams, R. N., commander of the *Tara*, fell into the hands of the *Senussi* on the Cyrenaican coast after their vessel had been torpedoed, were released by the armored car force, under the direction of the Duke of Westminster, which routed the Arabs near Sollum on March 14, on which day Sollum itself was reoccupied by General Peyton's force.—*Army and Navy Gazette*, 25/3.

BLACK SEA

RUSSIAN HOSPITAL SHIP "PORTUGAL" TORPEDOED.—The following are extracts from the official report:

At 8 in the morning of March 30 the steamer *Portugal*, a Franco-Russian hospital ship, was lying near Of, in Eastern Anatolia (east of Trebizond), having been sent there for wounded, when it was attacked by a German submarine and blew up.

Two torpedoes were fired, the second striking the engine room, and the vessel sank in less than a minute. There were on board 273 persons, of whom 158 were saved.

The Turkish Government had recognized the *Portugal* as a hospital ship, and she was painted with the prescribed colors. The attack was made in broad daylight. The submarine steered round the vessel and fired at her point-blank.—*Army and Navy Gazette*, 8/4.

TORPEDO-BOAT SUNK.—On the Black Sea on March 9, says a Petrograd *communiqué*, two Russian torpedo-boats reconnoitering the coast near Varna were attacked by enemy submarines. The torpedo boat, *Lieutenant Pustchin*, was blown up. Part of the crew were rescued by the other torpedo-boat.—*Army and Navy Gazette*, 18/4.

RUSSIAN TRANSPORT SUNK.—On April 3, Constantinople reported officially that "On March 30 our submarines sank, to the northeast of Batum, a Russian transport ship of about 1200 tons, full of soldiers and war materials. —*Army and Navy Gazette*, 8/4.

MISCELLANEOUS NOTES

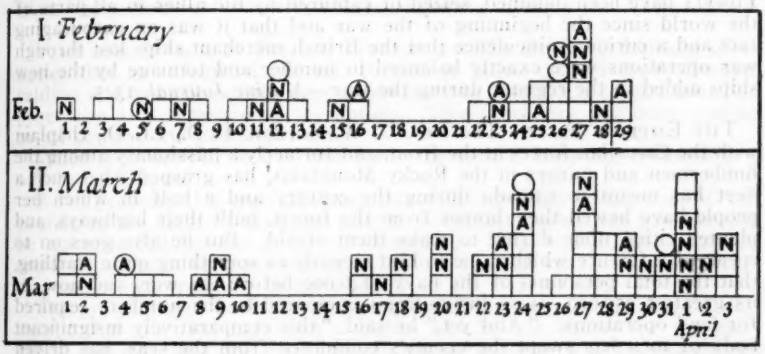
SEA POWER: PAST AND PRESENT.—In the Napoleonic wars, as to-day, the vital laws of sea power dominated war on land and involved the interests of neutral nations. La Hogue and Trafalgar, putting a terminus to French naval ambitions, mark the points where France, by her unwise abandonment of the sea, gave over her long and shifting rivalry with England. After Trafalgar, England was sure of victory, for she was assured of material independence and commercial supremacy, upon which she could secure unlimited credit and confidence. And in the after-math of victory she protected France from the effects of defeat; she barred the way to Prussian ambitions.

History repeats itself. To dominate the world, one must possess the sea. By coalitions, Europe maintains its equilibrium; by blockades, it brings to bear on the land victor the might of sea power. *In the drama of war, the most decisive, though not the most striking acts, are played upon the sea.—Journal des Débats*, 5/4.

CAMEROONS CONQUERED.—It was announced from the Colonial Office on Saturday last that a telegram on February 18 reported the capitulation of the German garrison at Mora, which completed the conquest of the Cameroons. In this campaign the British and French navies have assisted, and the ships mentioned as having been engaged include the cruisers *Cumberland*, *Challenger*, and *Bruix*, with the gunboat *Dwarf*. An unsuccessful attempt was made to sink the last named off the Cameroon River on September 13, 1914, by the German steamer *Nachtigall*, which rammed the vessel with an infernal machine in her bows. Captain Cyril T. M. Fuller, R. N., appears to have been the senior naval officer at the Cameroons during at least a large part of the campaign, but no official information on this point is yet available.—*Army and Navy Gazette*, 26/2.

A CONJECTURE ON FUTURE NAVAL OPERATIONS.—If the German Admiralty has anything "up its sleeve" it probably will have to do with its mining

and submarine offensive. The very serious nature of the secret mine planting from submarines which Germany is now practicing, seems not to have been generally appreciated, and this form of attack, impossible of immediate detection as it is, might be used to deadly effect in the strategy and tactics of the great North Sea fight—should it ever take place. We are still of the opinion moreover that before the German fleet comes out to battle, its Admiralty will call home and assemble in the North Sea the whole of the German submarine fleet; and probably on the great day of trial the Germans will plant floating mines where the water is too deep for anchorage, and fields of anchored mines in shoal water such as obtains on the Dogger Bank, and that she will assign groups of submarines to assemble at certain definite stations in the North Sea. The main fleet, if it fails to attract the British to the mined waters off the German coast, will probably steam boldly to the English coast, draw the British fleet out, and then itself make a running fight of it to the eastward, endeavoring to draw the British fleet over the mine fields or into one or other of the waiting submarine flotillas.—*Scientific American*, 25/3.



THE ABOVE DIAGRAMS SHOW SHIPS ATTACKED OR STRUCK BY MINES AND SUBMARINES IN THE MONTHS OF FEBRUARY AND MARCH AND THE FIRST THREE DAYS OF APRIL, 1916—*Land and Water.*

SHIPS LOST BY ALLIES AND NEUTRALS.—The most reliable statement of the total losses in merchant vessels, both steam and sail, is that recently made by Admiral Sir Cyprian Bridge. His report gives the total losses from the beginning of the war to March 23. The Allies have lost a total of 538 ships of an aggregate tonnage of 1,668,000. Great Britain heads the list with 410 ships, of 1,339,000 tons, France being second with 53 ships, of 158,000 tons, followed by Italy with 27 ships, of 73,000 tons, Russia with 35 ships of a total of 49,000 tons, Belgium with 10 ships, of 30,000 tons, and Japan with three ships of 19,000 tons. Very surprising in their magnitude are the losses of neutrals, which total 218 ships, with a total tonnage of 393,151 tons. The British loss in steam shipping is less than 4 per cent of the total number of vessels, and a little over 6 per cent of her total tonnage. The French have lost 7 per cent, the Russians 5 per cent, and the Italians 4.5 per cent.—*Scientific American.*

THE WAR AND THE WORLD'S TONNAGE.—According to statistics available at the Bureau of Foreign and Domestic Commerce, 2193 vessels have been swept from the seas by the war, with an aggregate tonnage of 3,774,219. Of this number, Great Britain has lost 485 with a total tonnage of 1,506,415, and France, Italy and Russia have together lost 167 ships with a tonnage

of 282,178. The number of German ships lost is 601, Austrian, 80, Turkish, 124, and neutral ships, 736. Eighty British ships are detained in German ports and nine in Turkish. Seventy-nine German vessels are detained in United Kingdom ports, 90 in overseas ports of Great Britain, 23 have been seized in British ports, 55 captured and sunk by the British. Eighty-one are detained in Belgian ports and 95 in French and Russian. Allied submarines have sunk 20 German ships, and 31 have been captured at sea.—*Marine Journal*, 8/4.

BRITISH MERCHANT SHIPPING REQUISITIONED.—Earl Curzon, Lord of the Privy Seal of Great Britain, recently stated that the British Government was now administering the whole British mercantile marine amounting to half the gross tonnage of the world. Forty-three per cent of British tonnage, he added, had been requisitioned for naval and military purposes, 14 per cent was occupied in carrying foodstuffs and raw material in behalf of the government and it allies, and the remaining 43 per cent was being operated by British shipowners under state regulations. From the same authority also comes the announcement that 450 vessels of the Central Powers have been detained, seized or captured by the allies in all parts of the world since the beginning of the war and that it was an encouraging fact and a curious coincidence that the British merchant ships lost through war operations were exactly balanced in number and tonnage by the new ships added to the register during the war.—*Marine Journal*, 13/5.

THE EMPIRE'S FLEET.—The Rev. C. W. Gordon, D. D., LL. D., chaplain with the Canadian forces at the front, and formerly a missionary among the lumbermen and miners in the Rocky Mountains, has grasped what such a fleet has meant to Canada during the century and a half in which her people have hewed their homes from the forest, built their highways, and planted cities, none daring to make them afraid. But he also goes on to speak of a feature which came to him recently as something quite startling, that the total personnel of the navy—146,000 before the war, and now, at its greatest 350,000—is so insignificant compared to the numbers required for land operations. "And yet," he said, "this comparatively insignificant body of men has swept the enemy's commerce from the seas, has driven his battleships and battle cruisers into hiding, and rendered his fleet (the second in the world) powerless; has sealed up his ports against all overseas traffic, has protected our trade routes, has supplied our allies with munitions and provisions, and has convoyed our troops from the other side of the world to the scene of war without the loss of gun or man. All this by a force of 350,000 men. What other like number of men at any time in the world's history has acheived results of such magnitude?" Dr. Gordon might have carried his argument further and shown that the keystone of our naval power, the Grand fleet, employs in its fighting vessels probably not more than 100,000 officers and men.—*Army and Navy Gazette*, 29/4.

THE "ARETHUSA."—In the current issue of the *London Magazine*, a seaman of the *Arethusa* named Sidney Rimington, who was in that light cruiser from August 21, 1914, until she was destroyed by a mine on February 11, 1916, describes his experiences at the affair in the Heligoland Bight, the raid on Cuxhaven, and the action off the Dogger Bank, while he also tells us that the *Arethusa* was present when the German auxiliary cruiser *Meteor*—which he calls *Mentier*—was caught after sinking the patrol vessel *Ramsey*—here referred to as a destroyer—and blew herself up to avoid capture. The narrative shows what a narrow escape from destruction the *Arethusa* had in the Heligoland Bight. When all her guns but one had been put out of action, the cruiser fired two torpedoes at the *Mainz*, and it was lucky she did so, says Rimington, for immediately afterwards a shell from the German ship struck the tube they had just left, and

would, had it been 30 seconds earlier, have exploded the torpedoes. In describing the work of patrolling the North Sea, the writer refers to two unpublished incidents, one in January, 1915, when he says that three enemy cruisers and at least a dozen destroyers were sighted leaving Heligoland, but returned when warned by submarine of the real strength of the British force; and the other when the *Arethusa*, off the German coast in stormy weather, was ordered to take in tow a disabled destroyer. One rope after another broke, and it took nine hours to get the thickest cable safely fastened to the destroyer. The work of dragging her stern first occupied another 36 hours.—*Army and Navy Gazette*, 29/4.

PRIZE CAPTURED AND RECAPTURED.—A British prize crew in charge of the Norwegian bark *Pestalozzi* was captured by a German submarine on April 22, while bound for Kirkwall. The prize crew had been placed on board the bark by a British cruiser about 160 miles west of the Hebrides. The German submarine commander spotted the *Pestalozzi* later, and after an investigation took the British officer and four men on board the submarine and left four others of the prize crew on board the bark, which was bound from Malmo to Argentina with a cargo of cement.—*Army and Navy Journal.*

VISIT AND SEARCH BY BRITISH WARSHIPS.—The British Admiralty gives notice that to safeguard neutral, British or allied traders from German raiding cruisers it has been found necessary to institute a special boarding procedure as a measure of precaution. This procedure has been notified to all neutral and allied powers.

When it is desired to put into force the special boarding procedure, it will be as follows:

A red pendant of a specially large size will be hoisted by the man-of-war exercising the right of visit and search. The hoisting of this pendant will be accompanied by the firing of a rocket. This will signify that the merchant ship is to close the boat lowered by the man-of-war, whether the man-of-war remains in the vicinity of the boat or not.

The procedure to be followed by night will be the same as that by day, except that the two red Very's Lights will be the signal for the merchant ship to close the boat, which where possible will be illuminated by searchlight. When weather precludes boarding, the man-of-war will fire two green Very's Lights, which will be the signal for the merchant ship to lie to until daylight.

This procedure will come into force immediately, but, pending the lapse of reasonable time for the new signals to become generally known, H. M. ships will communicate with merchant ships by visual signal in the International Code of Signals, if it is found that the meaning of the new signals is not understood.—*Shipping Illustrated*, 22/4.

AIRCRAFT AND THE GRAND FLEET.—The fact that the Zeppelins have reached Scotland raises the question whether the enemy is forming designs on our naval bases in the north. As we have seen in previous papers the probability of airships being able to injure war vessels under way is exceedingly slender. Commodore Tyrwhitt's most recent and most brilliant performances off the Island of Sylt, where he had five battle biplanes and a Zeppelin opposed to his cruisers and destroyers, confirmed the experiences of the Cuxhaven raid, and seems to be conclusive as to the capacity of well-handled ships to out-maneuver aircraft of all kinds without difficulty. The situation, however, would be very different if any considerable number of airships could be brought over a harbor in which a battle fleet was anchored. Here again the experiences of the Cuxhaven raid was instructive. The *Von der Tann*, which was conspicuous in the raid on Scarborough and Whitby, was absent from von Hipper's squadron in the affair of Dogger Bank. That she was desparately injured in the air attack on Cuxhaven has been widely stated in the American press. It is not supposed that she

was actually damaged by bombs dropped on that occasion, but it seems certain that the raid threw all the shipping into confusion, and that hectic efforts were made to get out of the harbor—as was recently the case at Zeebrugge. It was in the consequent confusion that *Von der Tann* is supposed to have run foul of some other ship or stone work, and so to have put herself out of action. No doubt the probabilities of Zeppelins catching any of the Grand fleet in similar conditions are small. But that an attempt to get at the fleet from the air seems more probable than it ever has seemed, is indisputable.

NAVAL EXPENDITURE.—In his budget speech on April 4, Mr. McKenna stated that the estimate of expenditure on the services had proved substantially accurate. In the previous September, he had said that he contemplated a navy costing £190,000,000, an increase on that for which his predecessor had budgeted of £44,000,000. Whether these sums included the cost of transport for the army was not made clear. In any case, the daily rate of £600,000 for the navy which the Prime Minister mentioned as the expediture in September, 1915, has not been maintained, and there was apparently a saving during the last six months of the financial year which ended on March 31 of approximately £29,000,000. When Mr. Lloyd George said that he anticipated the year's cost of the navy to be £146,000,000, he could not have based his calculation on the daily rate mentioned by the Prime Minister, for that would have meant an expenditure of £219,000,000. Nor is it possible either that he founded his estimate on the expenditure for the year ending March 31, 1915, which, according to the statement issued by the comptroller and auditor-general, was £103,301,862. But only eight months of that year was war time, and the daily expenditure before the war was about £150,000, so that the average rate during the first eight months of war must have been well below £400,000. Anyway, it is difficult from an examination of such official figures as has been issued to arrive at the real facts concerning naval expenditure during the war.—*Army and Navy Gazette,* 15/4.

RUMOR OF ENORMOUS GERMAN SUBMARINE LOSSES.—Our advices from abroad are to the effect that the German submarines destroyed or captured by the British now number between 150 and 175. Among them are included seven of the latest type of submarine. These, because of their size and the disturbance they make in the water, are more easily located than the smaller vessels of the earlier type. The Allies are also learning how to deal more effectively with hostile aircraft, making use of new guns developed since the war began.—*Army and Navy Journal.*

MUNITIONS AND THE FLEET.—The following letter has been addressed by the Minister of Munitions to Vice Admiral Sir David Beatty:

"February 22, 1916.

"DEAR SIR DAVID BEATTY,—I was greatly interested to receive from you details of the splendid work which has been done by the officers and men of the battle cruiser fleet in making munitions of war.

"The extent of the output which has already been reached is very striking, and it has been of real assistance to the equipment of the army. More important, however, than the material results achieved has been the magnificent spirit which has prompted the officers and men of your fleet to show their sympathy with their comrades in the trenches and to devote their leisure hours to giving them such loyal and effective support. The fact, also, that this heavy work has been carried out in their limited spare time and, by their own express wish, without any kind of remuneration greatly enhances its value.

"I shall be very glad if you can find some way of communicating the warm and grateful thanks of the Ministry of Munitions to the fleet for

their services in this matter, and at the same time assure them that any further work which they can do, on the same lines, will be most welcome and of real help to the army.

"Believe me, yours sincerely,

"D. LLOYD GEORGE."

—*United Service Gazette*, 2/3.

RELIEF SHIP LOST IN TIGRIS.—Since the *Mountjoy* grounded in the River Foyle at the siege of Londonderry there has been no episode in British history comparable to the unhappy grounding of the relief ship in the Tigris four miles below Kut. It will be interesting to learn more about the identity of this relief ship and those in charge of her. We have as yet had only meagre information about the ships in the Mesopotamia Expedition and the doings of the sailors forming their crews.—*Army and Navy Gazette.*

THE EVACUATION OF GALLIPOLI.—The following despatch has been received by the Secretary of State for War from General Sir C. C. Monro, K. C. B. It gives the first official account of our successful evacuation of Gallipoli. General Monro writes:

On October 20, in London, I received your Lordship's instructions to proceed as soon as possible to the Near East and take over the command of the Mediterranean expeditionary force.

My duty on arrival was in broad outline:

(a) To report on the military situation on the Gallipoli Peninsula.

(b) To express an opinion whether on purely military grounds the Peninsula should be evacuated or another attempt made to carry it.

(c) The number of troops that would be required:

(1) To carry the Peninsula;

(2) To keep the Straits open; and

(3) To take Constantinople.

The positions occupied by our troops presented a military situation unique in history. The mere fringe of the coast line had been secured. The beaches and piers upon which they depended for all requirements in personnel and material were exposed to registered and observed artillery fire. Our entrenchments were dominated almost throughout by the Turks. The possible artillery positions were insufficient and defective. The force, in short, held a line possessing every possible military defect. The position was without depth, the communications were insecure and dependent on the weather. No means existed for the concealment and deployment of fresh troops destined for the offensive—whilst the Turks enjoyed full powers of observation, abundant artillery positions, and they had been given the time to supplement the natural advantages which the position presented by all the devices at the disposal of the field engineer.

Another material factor came prominently before me. The troops on the peninsula had suffered much from various causes—exposure to shell fire, disease, the dearth of competent officers owing to earlier losses, and "makeshifts" due to the attachment of yeomanry and mounted brigades to the territorial divisions. Other arguments, irrefutable in their conclusions, convinced me that a complete evacuation was the only wise course to pursue.

On November 21 the peninsula was visited by a storm said to be nearly unprecedented for the time of the year. The storm was accompanied by torrential rain, which lasted for 24 hours. This was followed by hard frost and a heavy blizzard. In the areas of the 8th corps and the Anzac corps the effects were not felt to a very marked degree owing to the protection offered by the surrounding hills. The 9th corps were less favorably situated, the watercourses in this area became converted into surging rivers, which carried all before them. The water rose in many places to the height of the parapets and all means of communications were prevented. The men, drenched as they were by the rain, suffered from

the subsequent blizzard most severely. Large numbers collapsed from exposure and exhaustion, and in spite of untiring efforts that were made to mitigate the suffering, I regret to announce that there were 200 deaths from exposure and over 10,000 sick evacuated during the first few days of December.

From reports given by deserters it is probable that the Turks suffered even to a greater degree.

The problem with which we were confronted was the withdrawal of an army of a considerable size from positions in no cases more than 300 yards from the enemy's trenches, and its embarkation on open beaches, every part of which were within effective range of Turkish guns, and from which in winds from the south or south-west the withdrawal of troops was not possible.

I came to the conclusion that our chances of success were infinitely more probable if we made no departure of any kind from the normal life which we were following both on sea and on land. A feint which did not fully fulfil its purpose would have been worse than useless, and there was the obvious danger that the suspicions of the Turks would be aroused by our adoption of a course the real purport of which could not have been long disguised.

Rapidity of action was imperative, having in view the unsettled weather which might be expected in the Ægean. The success of our operations was entirely dependent on weather conditions. Even a mild wind from the south or southwest was found to raise such a ground swell as to greatly impede communication with the beaches, while anything in the nature of a gale from this direction could not fail to break up the piers, wreck the small craft, and thus definitely prevent any steps being taken towards withdrawal.

Throughout the period December 10 to 18 the withdrawal proceeded under the most auspicious conditions, and the morning of December 18 found the positions both at Anzac and Suvla reduced to the numbers determined, while the evacuation of guns, animals, stores and supplies had continued most satisfactorily.

It was imperative, of course, that the front-line trenches should be held, however lightly, until the very last moment, and that the withdrawal from these trenches would be simultaneous throughout the line.

The good fortune which had attended the evacuation continued during the night of the 19-20. The night was perfectly calm with a slight haze over the moon, an additional stroke of good luck, as there was a full moon on that night.

Soon after dark the covering ships were all in position, and the final withdrawal began. At 1.30 a. m. the withdrawal of the rear parties commenced from the front trenches at Suvla and the left of Anzac. Those on the right of Anzac who were nearer the beach remained in position until 2 a. m. By 5.30 a. m. the last man had quitted the trenches.

At Anzac four 18-pounder guns, two 5-inch howitzers, one 4.7 naval gun, one anti-aircraft, and two 3-pounder Hotchkiss guns were left, but they were destroyed before the troops finally embarked. In addition, 56 mules, a certain number of carts, mostly stripped of their wheels, and some supplies, which were set on fire, were also abandoned.

At Sulva every gun, vehicle and animal was embarked, and all that remained was a small stock of supplies, which were burned.

On December 28 your Lordship's telegram ordering the evacuation of Helles was received, whereupon, in view of the possibility of bad weather prevailing, I instructed the general officer commanding Dardanelles army to complete the operation as rapidly as possible. He was reminded that every effort conditional on not exposing the personnel to undue risk should be made to save all 60-pounder and 18-pounder guns, 6-inch and 4.5 howitzers, with their ammunition and other accessories, such as mules, and A. T. carts, limbered wagons, etc.

At a meeting which was attended by the vice-admiral and the general officer commanding Dardanelles army, I explained the course which I thought we should adopt to again deceive the Turks as to our intentions. The situation on the peninsula had not materially changed owing to our withdrawal from Suvla and Anzac, except that there was a marked increased activity in aerial reconnaissance over our positions, and the islands of Mudros and Imbros, and that hostile patrolling of our trenches was more frequent and daring. The most apparent factor was that the number of heavy guns on the European and Asiatic shores had been considerably augmented, and that these guns were more liberally supplied with German ammunition, the result of which was that our beaches were continuously shelled, especially from the Asiatic shore. I gave it as my opinion that in my judgment I did not regard a feint as an operation offering any prospect of success; and it was decided the navy should do their utmost to pursue a course of retaliation against the Turkish batteries, but to refrain from any unusually aggressive attitude should the Turkish guns remain quiescent.

General Sir W. Birdwood had, in anticipation of being ordered to evacuate Helles, made such complete and far-seeing arrangements that he was able to proceed without delay to the issue of the comprehensive orders which the consummation of such a delicate operation in war requires.

The evacuation, following the same system as was practised at Suvla and Anzac, proceeded without delay. The French infantry remaining on the peninsula were relieved on the night of January 1-2, and were embarked by the French Navy on the following nights. Progress, however, was slower than had been hoped, owing to delays caused by accident and the weather. One of our largest horse ships was sunk by a French battleship, whereby the withdrawal was considerably retarded, and at the same time strong winds sprang up which interfered materially with work on the beaches. The character of the weather now setting in offered so little hope of a calm period of any duration that General Sir W. Birdwood arranged with Admiral Sir J. de Robeck for the assistance of some destroyers in order to accelerate the progress of re-embarkation.

Meanwhile the 8th corps had maintained the offensive spirit in bombing and minor operations with which they had established the moral superiority they enjoyed over the enemy. On December 29 the 52d division completed the excellent work which they had been carrying out for so long by capturing a considerable portion of the Turkish trenches, and by successfully holding these in the face of repeated counter-attacks. The shelling of our trenches and beaches, however, increased in frequency and intensity, and the average daily casualties continued to increase.

On January 7 the enemy developed heavy artillery fire on the trenches held by the 13th division, while the Asiastic guns shelled those occupied by the Royal Naval Division. The bombardment, which was reported to be the heaviest experienced since we landed in April, lasted from noon until 5 p. m., and was intensive between 3 p. m. and 3.30.

January 8 was a bright, calm day, with a light breeze from the south. There was every indication of the continuance of favorable conditions, and, in the opinion of the meteorological officer, no important change was to be expected for at least 24 hours. The Turkish artillery were unusually inactive. All preparations for the execution of the final stage were complete.

About 7 p. m. the breeze freshened considerably from the southwest, the most unfavorable quarter, but the first trip, timed for 8 p. m., was despatched without difficulty. The wind, however, continued to rise until, by 11 p. m., the connecting pier between the hulks and the shore at "W" Beach was washed away by heavy seas, and further embarkation into destroyers from these hulks became impracticable. In spite of these difficulties the second trips, which commenced at 11.30 p. m., were carried out well up to time, and the embarkation of guns continued uninter-

ruptedly. Early in the evening reports had been received from the right flank that a hostile submarine was believed to be moving down the straits, and about midnight H. M. S. *Prince George*, which had embarked 2000 men, and was sailing for Mudros, reported she was struck by a torpedo which failed to explode. The indication of the presence of a submarine added considerably to the anxiety for the safety of the troop carriers, and made it necessary for the vice admiral to modify the arrangements made for the subsequent bombardment of the evacuated positions.

At 1.50 a. m. Gully Beach reported that the embarkation at that beach was complete, and that the lighters were about to push off, but at 2.10 a. m. a telephone message was received that one of the lighters was aground and could not be refloated. The N. T. O. at once took all possible steps to have another lighter sent in to Gully Beach, and this was, as a matter of fact, done within an hour, but in the meantime, at 2.30 a. m., it was decided to move the 160 men, who had been relanded from the grounded lighter, to "W" Beach and embark them there.

At 3.30 a. m. the evacuation was complete, and abandoned heaps of stores and supplies were successfully set on fire by time fuses after the last man had embarked. Two magazines of ammunition and explosives were also successfully blown up at 4 a. m. These conflagrations were apparently the first intimation received by the Turks that we had withdrawn. Red lights were immediately discharged from the enemy's trenches, and heavy artillery fire opened on our trenches and beaches. This shelling was maintained until about 6.30 a. m.

Apart from four unserviceable 15-pounders which had been destroyed earlier in the mouth, 10 worn-out 15-pounders, one 6-inch Mark VII gun, and six old heavy French guns were left on the peninsula. In addition to the above, 508 animals, most of which were destroyed, and a number of vehicles and considerable quantities of stores, material, and supplies, all of which were destroyed by burning, had to be abandoned.

The entire evacuation of the peninsula had now been completed. It demanded for its successful realization two important military essentials, viz., good luck and skilled disciplined organization, and they were both forthcoming to a marked degree at the hour needed. Our luck was in the ascendant by the marvellous spell of calm weather which prevailed. But we were able to turn to the fullest advantage these accidents of fortune.

Lieutenant General Sir W. Birdwood and his corps commanders elaborated and prepared the orders in reference to the evacuation with a skill, competence, and courage which could not have been surpassed, and we had a further stroke of good fortune in being associated with Vice Admiral Sir J. de Robeck, K. C. B., Vice Admiral Wemyss, and a body of naval officers whose work remained throughout this anxious period at that standard of accuracy and professional ability which is beyond the power of criticism or cavil.—*United Service Gazette*, 20/4.

NAVAL PUBLICATIONS

BOOK REVIEWS

"First Aid in Emergencies." By Eldridge L. Eliason, M. D. (J. B. Lippincott Co.)

The question of first aid is always of vital importance, but it is more so now than ever before, for there are wars and rumors of wars, and everyone feels the need of preparing him or herself to do his or her part in case of need. As evidence of this, there are now three classes, each composed of 25 women, being instructed by Naval Medical Officers at this station. Many books have been written on the subject by men within and without the services, and prominence given to domestic, industrial or military first aid, depending upon the point of view of the writer. In this book by E. L. Eliason of the University of Pennsylvania, all points are well covered and it may well be considered a *vade mecum* by all who desire a practical knowledge of first aid methods. No words are wasted in the little book; it is simple, concise and the plates are clear and explicit, so that he who runs may read, which is often necessary in case of an accident. The thumb index facilitates finding the different subjects, which saves time and perhaps time which is life saving. Of course it is better not to wait until the hour and minute of need in order to know what to do in an emergency, but the majority of the laity has to be re-assured, especially when the case may be one of life or death, therefore, it would be well to know this handy first aid book from cover to cover and have a working knowledge of the contents, so that it will only be necessary to refer to it for re-assurance, after, not before, the good deed was done. *"Send for a doctor"* is good and sound advice, but no doctor may be in reach and everything may depend upon one's individual efforts, besides, doctors are getting scarce since the standards of medical education have become higher; rural districts are already suffering—only three out of 1000 Johns Hopkins' graduates have settled in rural Maryland in the last 10 years—and again, all England feels the need of physicians, so loud has been the cry for them by the call of the war; so it would be in this country. The feeling that you are prepared to give help, to relieve pain and even to save life makes it well worth while to study first aid methods and be able to apply them; the ways and the means are made available for everyone by Eliason. No technical knowledge is required, and, in this field, a little knowledge is not apt to be dangerous, but helpful; it certainly is worth while trying to acquire it, and the more the better.

A. M. D. McC.

"Fundamentals of Military Service." By Captain Lincoln C. Andrews, U. S. Cavalry. (J. B. Lippincott Co.)

This book is a most interesting, instructive and valuable addition to this nation's military library. Every ambitious soldier, whether in the ranks or a commissioned officer, should read it carefully. Although written primarily for the information and instruction of the volunteer or citizen soldier, yet the professional soldier will find much of interest and value to him in its various chapters.

Beginning with a short chapter on "Our Military Policy" (or rather lack of policy), Captain Andrews takes up in logical sequence under the caption "Psychology of the Service," the subjects of Teamwork, Subordination, Discipline, The Squad System, Leadership, The Battlefield, and Courage and Fear. His treatment of "Leadership" is particularly able and inspiring, and should be of great assistance to the embryo officers and non-commissioned officers of our future national forces. Then follow chapters on Infantry, Field Artillery, Coast Artillery, Engineer Corps, and Signal Corps, written by different officers of those arms of the service. The author in his chapter on Cavalry makes the reader feel the dash and enthusiasm that are so requisite in the make up of the true cavalry leader. Chapters on Tactical Rules, Guard Duty, Riot Duty and Map Reading, contain innumerable valuable hints that can ordinarily be gained only by experience. Those on Patroling, Security, Marches and Convoys, Camps, Bivouacs, etc., emphasize the particular parts of Field Service Regulations applicable to the new and inexperienced leader.

The naval officer and petty officer who is detailed for duty with a landing force destined for active service will do well to read carefully the chapters on "Psychology of the Service", "Military Training", "Infantry Drill", "Patroling", "Security", "Camps and Bivouacs", and "Sanitation". It must be borne in mind, however, that this book in no way takes the place of the Drill Manual or Field Service Regulations, but is meant to assist the student in grasping the subject, and particularly to convey the spirit and meanings of the various branches of the military service.

Captain Andrews has succeeded admirably, not only in producing an efficient text and reference book, but in making it thoroughly readable. He has evaded dry statistics, yet impressed the reader with the important details that should be known by all successful soldiers.

J. W. W.

"The Neutral Merchant in Relation to the Law of Contraband of War and Blockade Under the British Order in Council of 11th March, 1915." By Sir Francis Piggott, late Chief Justice of Hong Kong. (University of London Press, Ltd., 1915.)

These articles, written in justification of the British Order in Council of 11th March, 1915, were published in the English monthly, *The Nineteenth Century and After*, and are here reprinted in a more permanent form under the title given above and prefaced by an introduction by the author. Sir Francis Piggott quotes largely from the celebrated letters of "Historicus," written by Sir Vernon Harcourt in view of the events of our Civil War,

and especially the conduct of Great Britain in regard to the fitting out of the *Alabama* and similar craft.

"The neutral merchant," Sir Francis well says, "is the center round which the principal doctrines of international law dealing with neutrality have gathered. . . . . Each belligerent has need of him, and it is essential to each to prevent the other from satisfying that need. To block the enemy's communications with the neutral merchant is one of the surest ways of ending the war." So far so good. A great deal of mock pity and indignation as well as hypocrisy has been wasted upon the neutral merchant, especially the American neutral merchant, who, desirous of war profits, fishes in troubled waters on either or both sides.

But prize cases should be governed by international law as agreed upon at the outbreak of the war, with an allowance for judge-made law as a matter of interpretation of law universally accepted, but with a further allowance for changes made by the inevitable progress in means of warfare both direct and indirect. For instance, the present Secretary of State of the United States has recently remarked that gasoline and its evolved machinery has made more changes than any one thing in warfare. The ability of the submarine, the aeroplane and the motor vehicles creates a change which has to be recognized, not at the end of this war, but at once and with all the consequences that are entailed. The enhanced use of copper and the great use of cotton in the fibrous explosives bring cotton and copper at once within the class of contraband—absolute contraband. The use of wood as a fibrous substitute for cotton has not been successful, as time is required for the changes necessary in the artillery concerned.

The Declaration of London, so laboriously evolved, was affected in its list of contraband articles almost immediately by the changes in the means of warfare, and as the articles of the Declaration had really to be accepted by its provisions as a whole or not at all, it became at once a misfit and was ignored by all the signatory powers, of which we were the only one that had proceeded as far as the point of ratification. Our present Secretary of State fell back upon what he termed the traditions of the past, but he has recovered to the extent to recognize the authority in the United States of the judicial decisions of our own and English courts, a recognition suggested in some cases by the controversy that has arisen about the neutral merchant and his beneficent aims.

The first point of discussion brought forward by the author of the articles under review is the question of the use of neutral flags by belligerent merchantmen or men-of-war. Although this use of a neutral or false flag is no longer tolerated in land warfare, it is still the recognized practice afloat. The writer believes that this *ruse de guerre* should not be permitted afloat, and he has had considerable experience in endeavoring to change our regulations to the contrary. In "The Laws and Usages of War at Sea," which was for some little time authoritative in our naval service, Article 7 provided that "the use of false colors in war is forbidden," and this was for a short time engrafted in the Navy Regulations, but was never issued as such to the service. In view of the practices of the present war, it seems to the writer desirable, although it is extremely doubt-

ful whether it would make any change in the callousness and ruthlessness of German submarine warfare, as practiced at present without regard to any flag or any nationality.

With respect to the interference with neutral trade and the neutral merchant in time of war, the author is justified in asserting that such interference is inevitable, and has arisen in every maritime war, and to an extent by us in our Civil War, which stretched the rules of international law beyond anything in the past. The rule that the taint of running a blockade exists from the time of leaving the home port until return was only given up by us by the Declaration of London, and by the canceling of that Declaration by our Department of State, is revived according to the usages and "traditions" of international law.

Whether we recognize it or not, the war zone of belligerency exists and with it certain natural rights of interference with neutral or so-called neutral trade. Our blockade exceeded the traditional rights of blockade, especially the continental interpretation, to the extent that the border line between the day and night zone gave the position of outside blockade and a cordon of blockaders on the outside blockade far away from the coast and ports blockaded. The continuous voyage for blockade and contraband cargos created or applied in our Civil War by circumstances is not unnaturally revived by the geographical and maritime position of the German territory and its intervening countries. Having made our protests with authoritative decisions not always favorable, there seems to be no necessity for forcing the issue but to await the post-bellum decisions of arbitral tribunals.

It would trespass upon your space to make an extended review of the volume under discussion, but the reviewer cannot close without calling attention to the fact that the British Order in Council was issued as a reply to and *after* the German submarine attacks on merchant shipping in the war zone. Reprisals, whether proceeded into in accordance with a partly established routine or not, are matters of a vague sphere. They are, I suppose, rather recognized than sanctioned, and seem to be loved more by civilians than military men. In this state we will leave them.

As to the "neutralization of the high seas," a highly sophisticated invention to nullify sea power, it can only be regretted that the unsophisticated pacifists of other countries should allow themselves to be used as cat's paws to vitiate one of the undeniable rights of war, concerning which on land Germany is unyielding.

There are several points which cannot be treated here with sufficient fulness, in which British Orders in Council approach a violation of international law as formerly understood. They are matters which should be thrashed out before arbitral tribunals, whose decisions will in prize cases maintain, I believe, the contentions of a number of our points independent of the rise and fall of prices of cotton, or rubber, or copper. C. H. S.

"Roadside Glimpses of the Great War." By Arthur Sweetser. (New York, The Macmillan Company, 1916.)

As the title of Mr. Sweetser's book frankly and accurately indicates, it is a record of his personal experiences and observations which does not

pretend to go beyond the actual range of his vision as an eye-witness. In agreeable contrast to the writngs of certain war correspondents, it does not deal in second-hand information, magnify the unimportant, indulge in surmise, or resort to invention. Its limitations are obvious, since it has but little value from the military point of view, and since the author does not attempt to explain the wherefore or the why of the facts he states, or to draw from them any but clearly implied generalizations. The effect of this honest method is to convince the reader that all statements of fact in the book—and some of them are extraordinary— are true.

The author's experiences rise to the dignity of adventures. More than once he is a prisoner and in imminent danger of being shot as a spy. Yet his sense of humor never fails him, and the most perilous situations in which he finds himself have elements that are irresistibly comic. With a fearlessness that is admirable, and with an audacity, an utter temerity bordering on impudence, equally characteristic of the American war correspondent, he rides his battered bicycle from the French to the German lines and back again to the French lines, armed with both French and German passports as well as American, offering strong circumstantial evidence that he is the spy he is twice charged with being. The luck which "pulls him through" is not short of amazing. Something of his attitude of mind may be gained from the following typical passage: "Now indeed I was within the German lines, a pretty pickle indeed, I began to fear. In four days I had swung around the French and British flanks, from the French and British rear to the German rear, and was hearing the same battle which I had heard only a few days before from the exactly opposite side. What would they say when they found me? The die was cast; I might as well go forward as back." Soon afterward, a German officer cheerfully informed him that the United States and Germany were fighting as allies in Kiaochao, and gave him a pass to Paris! This pass, a photograph of which forms the frontispiece of the book, is, according to Mr. Sweetser, "probably the only German military pass to Paris since 1870." It was given to him by the commandant at St. Quentin, and subsequently, when he was arrested in the French lines, it came near proving his undoing.

The narrative begins with Mr. Sweetser's departure from Paris during the first days of the war. He had been told that "not even a rabbit could get through to Lille," but he got there, taking in Amiens on the way. He talked with the wounded British Tommies after Mons, within sound of the battle of Cambrai; at Lille he bought his memorable bicycle and, with the reputation of being a madman, rode to Douai, Aniche, Valenciennes, Solesmes, le Cateau, St. Quentin. Thence, southward, "in the wake of von Kluck," he was virtually a prisoner, escorted by two bicycle scouts, however, in the most friendly fashion. Arrived at Senlis, he found the main street still burning. When the German retreat began, after the Marne, his escorts left him, and he was seized by a French patrol. Finally he was allowed to go to Paris, where he made a report to Ambassador Herrick.

After a short rest, he found Paris unbearably dull, and the "lure of war" led him to set out once more on his bicycle. He went over the battlefield of the Marne, and then proceeded north to Compiégne and the battlefield

of the Aisne, where he witnessed the fighting at rather close quarters. Once more he was taken prisoner, and the chapter "How a Spy Would Feel" is perhaps the best piece of writing in the book. Later he retraced his way to Belgium, left Lille just as the Germans entered the city, made his way to Ghent, and on a motor trip to Antwerp witnessed fighting between the Belgians and the Germans along the Nethe. "Belgium's Hopeless Heroism," the last chapter, is a vivid and a moving picture of what he saw, and includes two stories of unusual interest which the author repeats as credible.

Both of these accounts have to do with the treachery of German residents in Belgium: first, of how prominent Germans in Belgian government positions and in the Belgian army delayed mobilization until it was too late, and how King Albert first knew of the certainty of a German invasion through a letter to the Queen written by her father, the King of Bavaria; second, of the treachery with which a German, posing for years as a loyal Belgian army officer, surrendered to the German army the key-fort at Namur.

As a counterpoise to these accusations, the narrative contains but little evidence of German atrocities in France, and records the sober statements of German officers concerning the outrages committed against German soldiers by the civilian population both in Belgium and France. It is worthy of note that Mr. Sweetser does not generalize about these things. He tells the reader exactly what he saw and what he heard, whenever it is worth telling. He is concerned with the *human* side of the war as he saw it, and this human side, ranging from the sordid and squalid to the heroic and beautiful, from the grotesque and comic to the depths of pathos and tragedy, is always treated with reserve and impartiality. Human beings, whether they be German, British, French, or Belgian, look very much alike to the author of "Roadside Glimpses of the Great War." H. C. W.

"Rights and Duties of Neutrals." A Discussion of Principles and Practices. By Daniel Chauncey Brewer. $1.25. (G. P. Putnam's Sons, New York, 1916.)

The greater part of this book was prepared for and published in the Army and Navy Journal and is probably not entirely new to our readers. Nevertheless it is a wise thing to preserve this matter with the additions in a permanent shape for future use and reference.

Time is slipping by and it has taken so long for our foreign policy to be put in a satisfactory shape that we have lost the opportunity of establishing principles that would govern in a future war in which we may or may not be involved. *Unchallenged practice at the present time inevitably becomes established usage in the future.* This not only applies to neutrality which is recognized by the author, but also applies to humanity in connection with new features of war especially to aerial warfare and collective punishment of the innocent for apparent or real infractions of the rules of war. We are recognizing the claims of humanity in this the second year of the war as to submarine warfare, but more than one golden opportunity for a collective protest of the neutral powers against inhuman practices has gone by forever.

Concerning this, the author says on page 37, in words which are worth quoting, that, "Neutral states must therefore expect to go on record in such manner as will protect not only their own rights, but those of humanity. In declining to do this they assume great responsibility. On the other hand if they perform that which must be regarded as a duty of the most primary sort, it will not be at all astonishing if they find themselves later supported, and staunchly, too, by nations whose eyes are for the present holden that they cannot see."

Interesting and timely chapters of this book treat of "hostile agents in neutral states," and "aliens in neutral states." It never seems to occur to those concerned that the planned operations in cities along or near the Canadian border or in New York City may be adopted in turn as a precedent by Canadians when neutrals or belligerents in their time. The Middle West will become, in such cases or in many other possible cases, in aerial warfare, as exposed and as accessible territory to the enemy as that near or on the sea coast. Aerial warfare is in its early stages, and a development is sure to come in greater endurance, increased speed, safety and stability, so that wherever the base of aerial operations may be, north, south, east or west, in time no part of our country wil be safe from such operations. Aerial operations are, as at present practiced and tolerated, more deadly to non-combatants, innocent men, women, children and babies than to military or naval combatants.

The atmospheric sea is free of rocks and shoals, reefs and coast lines, and the only efficient answer to such warfare is that presented by aerial craft. It is to be feared that both of the military services regard the aviation service of secondary or tertiary importance—hinges of the fleet and the army. Our traditions and prejudices are against its proper development.

Civilians and non-combatants should, however, be intensely interested in it, for they are sufferers, especially their women and children. It spares neither those favoring or opposing preparedness, the pacificist or the warrior, the run away or loyal American, the alien or citizen. Here is a subject in which humanity and preparedness are linked together.

C. H. S.

"The Mikado: Institution and Person." By William Elliot Griffis, D. D., L. H. D. Price, $1.50 net. (Princeton University Press.)

The large number of books dealing with Japan and things Japanese may be divided into two general classes by authorship, those whose authors are but hesitating globe trotters, and those whose authors know their Japan from long residence and life work among the Japanese as teacher or missionary. The former consists in large part, as Chamberlain says, of "twaddle enlivened by statistics at second-hand"; the latter contain much of interest and first-hand information, though all too frequently marred by blind infatuation for everything Japanese. In "The Mikado" the author has had a fund of personal information and association to call upon, and at the same time has been able to apply to his subject the impartial scientific mind.

There is probably no foreigner living better equipped than Dr. Griffis to write of the institution and person of the Mikado, and he has done so in his usual interesting way. Dismissing with a stroke of the pen the fiction so dear to Japanese of the Imperial Line "unbroken for ages eternal," he yet finds the basis of this belief (Mikadoism) to be the mainspring of the greatness of Japan. That which is frequently taken to be a form of super-patriotism is in reality Mikadoism, the source of all virtue in Japanese eyes.

The greater part of Dr. Griffis' book has to do with the era of transformation in Japan covered by the reign of the late Emperor Mutsuhito—the Era of Enlightenment. With 40 years of this era the author is familiar from personal association and residence in Japan, and what he has to say concerning it is both instructive and interesting.

No book dealing with the transformation period in Japan can be complete without more or less mention of the *Yatoi*, or foreign employees, who played such an important part in guiding along the right paths the first step in this transformation. Dr. Griffis, as one of these guides, speaks with authority in his references to their influence and unselfish devotion to Japan and her interests.

"The Mikado," despite the large number of books about Japan, is very timely, for the secrets of good government the world over are being sought as never before, and Mikadoism is beyond question one of the major political influences in Japan tending to unselfish national spirit and good government.

The author's frequent and deservedly complimentary references to Dr. Verbeck, a fellow *Yatoi*, are particularly interesting to Americans, and it would be very well if they would take to heart his advice to members of the Japanese cabinet in 1870. Among other things, he said, " . . . . while peace is the dream of philosophers and the hope of the Christian, war is the history of mankind. . . . . create a truly national army. . . . . It will destroy sectionalism and excess of class conceit, and will fill the people in every part of the country with a proper pride in the welfare of the whole nation . . . . " Better or more fitting advice could not be given our own people to-day. L. A. C.

"Ordeal by Battle." By Frederick Scott Oliver. (New York, The Macmillan Company.)

Concerning this book Ex-President Roosevelt has expressed the following opinion: "In its practical teachings the best book that this war has produced is Oliver's 'Ordeal by Battle.' I wish that every American would read Mr. Oliver's book, and would realize that everything there said as to both the shortcomings and the needs of the English people applies with far greater force to the American people at the present time." This high but fairly deserved praise is reinforced by the *New Republic*, which says: "Here at last is a man (an Englishman at that) who in the midst of a vast chaos of uncertainties has a definite thesis to maintain and the power to build from that thesis an illuminating contribution to the present debate. . . . . It is a brilliant argument, to the splendid eloquence of which the mere

statement does less than the barest justice. Nowhere have I seen so clearly limned the patent vices of modern English politics. And it is a stirring appeal."

Of the many books written about various aspects of the great war—and at least 30 of them are important—comparatively few concern American problems directly by applying the lessons of the war to a constructive estimate of the ways and means by which the United States should benefit by these lessons. These few books referred to discuss the military unpreparedness of the United States and also point the way to the attainment of preparedness. Nevertheless, such books, even if they accomplish their purpose successfully, have not given us "the last word," for they leave unsolved the equally important political problems of democracies, problems which must be solved before the American democracy, in particular, can find true security in a military and naval sense. The "Ordeal by Battle" is a searching treatise on the shortcomings of Great Britain's military policy, her methods of dealing with the English people in regard to military affairs, the vices of party politics in a democracy, which lead to neglect of paramount national issues, and the fallacy of the voluntary military system. No one has shown more clearly than Mr. Oliver the vast difference between Peace—the greatest of British as of American interests—and Pacificism, of all "doctrines" the most futile and the most deceptive. He treats with true philosophy the causes of wars and the impossibility, as in the case of our own Civil War, of reconciling the irreconcilable. He flays the politician who seeks above all else, including the nation's security, the interest of his party, who lulls the people into a false sense of security by baseless words of optimism and half-truths, who fears, or at least fails to tell the people what their dangers are, and how they must face them. He flays the people who, reluctantly, pay the least possible sum to professional soldiers to do their fighting for them, who regard these soldiers as inferior beings, refuse them market rates of labor pay and the civilian's privilege of "striking," but feed them into the maw of war against tremendous odds of a "conscript" enemy.

Throughout the book—and herein lies its value to Americans—the most astonishingly direct parallels may be drawn between British and American shortcomings. This is especially true of the longest and most important part of the book, Part IV, "Democracy and National Service."

The keynote of all that Mr. Oliver has to say is to be found on the title-page, in an illuminating quotation from the stern old Puritan classic, "Pilgrim's Progress": "With that they looked upon him, and began to reply in this sort: SIMPLE said, *I see no danger;* SLOTH said, *Yet a little more sleep;* and PRESUMPTION said, *Every Vat must stand upon his own bottom.* And so they lay down to sleep again, and Christian went on his way."

H. C. W.

NAVAL ACADEMY GRADUATES' ASSOCIATION

The thirty-first annual reunion of the graduates of the U. S. Naval Academy will be held on Thursday, June 1, 1916, at the Naval Academy.

The business meeting will be held in the Officers' Mess Building at 3.30 p. m., and formation for the dinner at 7.30 p. m. in Blake Road. As there are several matters of importance to be brought before this year's meeting, a large attendance is requested.

The Secretary has been informed that Class '81, who were to have held their thirty-fifth year reunion this year, have postponed it until 1918. Several other classes will hold class reunions this year, some at the Academy at the time of our annual dinner, and others later, possibly near the time of the Army-Navy football game.

This year a new edition of the Graduates' Register will be issued, as it has been customary to issue a new edition every four years. Due to a gradual increase in the cost of labor and materials, and to the increasing size of the book itself, the Association finds it very difficult to finance each new edition.

The income of the Association is a rather uncertain quantity, as the only source from which it can be drawn is from the entrance fees of new members. This question of income is one which the Association will have to take up for serious consideration in the near future.

In discussing ways and means to finance the 1916 Register, the Council thought that a number of the members of the Association would be glad to have their copies in a more permanent form than that of the usual paper-covered book heretofore issued, and that they would be willing to pay a small amount for a suitable cloth binding. It was therefore decided to have a part of the new edition bound in cloth, and members so desiring may have the cloth-bound book for 50 cents; the small margin of profit over the additional cost to go towards defraying the cost of the issue. To those members who may not care to have the cloth-bound book, the

usual paper-covered copies will be furnished without cost. To non-members of the Association, and to members desiring extra copies, the paper covered will be supplied at $1.00 and the cloth covered at $1.25 per copy.

As it will be necessary to know the exact proportion of the edition to have bound, all orders, accompanied by money order or check, should be sent to the Secretary not later than June 30, 1916.

Last year at the annual meeting it was proposed that the graduates should install at the Academy a suitable bronze tablet to the memory of our old swordmaster, Lieutenant A. J. Corbesier, U. S. M. C. This proposal was adopted, as it was felt that every graduate, who had ever come under Lieutenant Corbesier's instruction, would be more than willing to subscribe for such a purpose.

Subscriptions of not over $1.00 each can be sent to the Treasurer of the Association, who is acting treasurer for the committee. In the meantime, and that the matter may be brought to an early conclusion, one of the members of the committee has underwritten the whole amount necessary for the erection of the tablet.

There is given, in this issue, a list of those graduates out of the service whose whereabouts are unknown. The Secretary would appreciate any information which might lead to their location. Look the list over carefully, and see if there are not some whom you can possibly place.

GRADUATES OF THE ACADEMY WHOSE WHEREABOUTS ARE UNKNOWN

Class '47 Cook, Joseph J. Res., Dec. 9, '51, P. Mid.
" '54 Oakley, Eugene H. Res., May 9, '56, Lt.
" '55 Taylor, Jess. Res., Sept. 12, '59, Lt.
" '55 Dalton, Hamilton H. Res., July 1, '61, Lt.
" '56 Gove, Gilman D. Res., Feb. 26, '63, Ens.
" '58 May, Luther C. Res., Aug. 21, '58, Mid.
" '61 Benton, Mortimer M. Res., Apr. 20, '61, Mid.
" '61 Haskins, Benjamin F. Res., July 7, '64, Ens.
" '64 Caldwell, Albert G. Res., Nov. 7, '84, Lt. Comdr.
" '64 Wilson, Thomas S. Res., Aug. 28, '65, Mid.
" '65 Rowe, Edward V. Res., Feb. 25, '67, Ens.
" '65 Vaughan, John A. Res., Dec. 6, '70, Master.
" '65 White, Oscar. Res., Nov. 28, '68, Master.
" '66 Stewart, David A. Res., Mar. 12, '69, Ens.
" '66 Housel, Louis V. Res., Mar. 31, '74, Lt.
" '67 Webster, Lewis D. Res., Feb. 28, '73, Lt.

Class '67 Henrichs, Edward W. Res., Nov. 30, '71, Master.
" '67 Howes, Frederick A. Res., Dec. 1, '73, Master.
" '67 Nicholson, William D. Res., June 12, '71, Master.
" '68 Fletcher, James R. Res., Sept. 1, '68, Mid.
" '68 Peck, John B. Res., June 7, '69, Asst. Engr.
" '68 Foss, Cyrus D. Res., Nov. 1, '73, Asst. Engr.
" '69 Graydon, James W. Res., Sept. 15, '84, Lt.
" '70 Jouett, Landon P. Res., Feb. 18, '89, Lt.
" '70 Ellery, Frank, Jr. Res., Dec. 31, '80, Master.
" '71 Terrell, Charles. Res., June 30, '74, Mid.
" '71 Crandall, Albert A. June 25, '75, Ens.
" '71 Guertin, Frank. Res., Aug. 1, '85, Lt. (J. G.).
" '74 Nostrand, Warner H. Res., June 30, '86, Lt.
" '74 Hoffman, Frank J. Res., June 11, '89. P. A. Engr.
" '76 Case, Daniel R. Res., Jan. 8, '79, Mid.
" '76 Fisher, Elstner N. Res., Jan. 15, '85, Ens.
" '77 Paris, Russell C. Res., Dec. 1, '80, Mid.
" '77 Rogers, Henry H. Res., Mar. 30, '79, Mid.
" '78 Biddle, Spencer F. B. Res., Dec. 30, '81, Mid.
" '78 Wight, Charles L. Res., July 1, '82, Asst. Engr.
" '79 Clements, Abner B. Res., June 30, '90, Ens.
" '79 Barnard, Louis H. Res., Apr. 1, '80, C. Mid.
" '79 Ivers, Henry K. Res., July 1, '85, Asst. Engr.
" '80 West, George E. Res., Oct. 4, '83, Ens. (J. G.).
" '80 Huntoon, Fitz-Albert. Res., Apr. 14, '90, Ens.
" '80 Bullitt, Howard H. Res., Oct. 10, '90, C. Mid.
" '80 Smith, Albert E. Res., Dec. 7, '86, Asst. Engr.
" '81 Cockle, Rudolphus R. Res., June 30, '83, N. Cdt.
" '82 Grambs, William J. Res., June 30, '84, N. Cdt.
" '83 Agee, Alfred P. Res., June 30, '85, N. Cdt.
" '83 Ellinger, Julius. Res., Aug. 11, '83, N. Cdt.
" '85 Thompson, Alexander. Res., Mar. 1, '88, N. Cdt.
" '85 Pitner, Samuel E. Res., Sept. 20, '85, N. Cdt.
" '86 Johnson, Edwin Van D. Res., June 30, '88, N. Cdt.
" '90 Buck, William H. Res., Dec. 31, '02, Lt.
" '91 Kochersperger, Frank H. Res., June 30, '91, N. Cdt.
" '93 Peugnet, Maurice B. Res., Sept. 18, '95, Asst. Engr.
" '93 Carver, Martin. Res., June 14, '95, N. Cdt.
" '95 McCormack, Michael J. Res., July 27, '12, Lt. Comdr.
" '98 Babcock, John F. Res., Dec. 31, '05, Lt.
" '99 Morgan, Charles E. Res., Sept. 6, '03, Ens.
" '00 Landram, Clarence E. Res., July 7, '06, Ens.
" '01 Blair, George F. Res., Oct. 1, '05, Ens.
" '01 Nightingale, Garrad P. Res., Oct. 18, '07, Ens.
" '03 Thompson, Rufus S. Res., Aug. 19, '05, Mid.
" '05 Smith, Roy Charles. Res., Sept. 23, '11, Lt.
" '06 Woodruff, Charles A. Res., Nov. 10, '15, Lt.
" '07 Bassett, Claude O. Res., Mar. 31, '10, Mid.

Class '07 McCrary, Preston H. Res., Jan. 10, '13, Lt. (J. G.).
" '07 Jewell, Joseph W. Res., Nov., 14, '11, Ens.
" '07 Pritchard, Earl W. Res., Dec. 5, '07, Mid.
" '08 Martin, Alfred G. Res., Aug. 17, '10, Mid.
" '08 Smith, Frank Roop, Jr. Res., Oct. 9, '14, Ens.
" '08 Wilson, George F. Res., June 10, '10, Mid.
" '08 Earle, John Horatio. Res., May 28, '08, Mid.
" '08 Dague, William H. Res., Nov. 12, '14, Lt.
" '09 Harris, Joseph S. Res., Dec. 1, '10, Mid.
" '09 Nordyke, Horace W. Res., Nov. 26, '09, Mid.
" '09 Marion, Paul H. Res., Dec. 16, '14, Ens.
" '10 Smith, Harold. Res., Sept. 12, '10, Mid.
" '11 Reynolds, Frank F. Res., July 7, '15, Ens.
" '11 Clay, Henry S. McK. Res., June 30, '15, Ens.
" '13 Skinner, Harry G., Jr. Res., Dec. 10, '13, Mid.
" '13 Pendleton, Avid. Res., June 7, '13, Mid.
" '14 Lahodny, William J. Res., Nov. 21, '14, Mid.
" '14 Walker, Augustus W. Res., Aug. 14, '14, Mid.
" '15 Grimm, Henry F., Jr. Res., Oct. 7, '15, Mid.

CHANGES IN REGISTER

472 Class '61 Barker, Albert Edward. Ret., Mar. 31, '05, R. Adml. Died, Jan. 30, '16, Washington, D. C.

526 " '63 Dichman, Ernest Jefferson. Res., Dec. 31, '71, Lt. Comdr. Died, Apr. 20, '16, New York, N. Y.

666 " '66 Walker, Asa. Ret., Nov. 13, '07, R. Adml. Died, Mar. 7, '16, Annapolis, Md.

707 " '66 Moore, William Irwin. Ret., June 30, '00, Capt. Died, Feb. 19, '16, Morgantown, W. Va.

907 " '68 Symmes, Frank Jameson. Res., July 18, '71, Sec. Asst. Engr. Died, Mar. 14, '16, Berkeley, Cal.

1113 " '72 Fox, Charles Eben. Ret., Aug. 2, '11, R. Adml. Died, Feb. 12, '16, Washington, D. C.

1237 " '75 Hunt, Ridgely. Ret., Sept. 15, '97, Lt. Died, Feb. 23, '16, Washington, D. C.

1323 " '77 Dodd, Arthur Wright. Ret., June 30, '07, Capt. Died, Mar. 30, '16, Cheraw, S. C.

1480 " '80 Duncan, Louis. Res., June 30, '86, Ens. Died, Feb. 13, '16, Pelham Manor, N. Y.

1635 " '81 Beach, Robert James. Res., Apr. 21, '86, Cdt. Engr. Died, Feb. 7, '16, Pelham Manor, N. Y.

1800 " '85 Fenton, Theodore Cornell. Ret., June 30, '06, Comdr. Died, Mar. 22, '16, Philadelphia, Pa.

1916 " '88 Hartrath, Armin. Discharged, July 19, '01, Lt. Died, Feb. 26, '16, Chicago, Ill.

2416 " '00 Keating, Arthur Barnes. Declared a deserter from Aug. 6, '14, Lt. Comdr.

2517 Class '01 Oakley, Owen Horace. Died, Jan. 16, '16. Lt. Comdr., New York, N. Y.
2952 " '07 Page, Calvin Percy. Ret., Apr. 3, '16, Lieut.
2971 " '07 Milner, Frederick Wood. Ret., Feb. 11, '16, Lieut.
3576 " '10 Pailthorp, Ormond Cleveland. Died, Mar. 24, '16, on board U. S. S. *Saratoga*.
3899 " '12 Byrd, Richard Evelyn, Jr. Ret., Mar. 15, '16, Lt. (J. G.).
4109 " '13 McGuire, Thomas White. Ret., Jan. 24, '16. Ens.
4384 " '14 Alexander, William Dennison. Asst. Paymaster.
4442 " '14 Ring, Morton Loomis. Asst. Paymaster.

NOTICE

The U. S. Naval Institute was established in 1873, having for its object the advancement of professional and scientific knowledge in the Navy. It now enters upon its forty-third year of existence, trusting as heretofore for its support to the officers and friends of the Navy. The members of the Board of Control cordially invite the co-operation and aid of their brother officers and others interested in the Navy, in furtherance of the aims of the Institute, by the contribution of papers and communications upon subjects of interest to the naval profession, as well as by personal support and influence.

On the subject of membership the Constitution reads as follows:

ARTICLE VII

Sec. 1. The Institute shall consist of regular, life, honorary, and associate members.

Sec. 2. Officers of the Navy, Marine Corps, and all civil officers attached to the Naval Service, shall be entitled to become regular or life members, without ballot, on payment of dues or fees to the Secretary and Treasurer. Members who resign from the Navy subsequent to joining the Institute will be regarded as belonging to the class described in this Section.

Sec. 3. The Prize Essayist of each year shall be a life member without payment of fee.

Sec. 4. Honorary members shall be selected from distinguished Naval and Military Officers, and from eminent men of learning in civil life. The Secretary of the Navy shall be, *ex officio*, an honorary member. Their number shall not exceed thirty (30). Nominations for honorary members must be favorably reported by the Board of Control, and a vote equal to one-half the number of regular and life members, given by proxy or presence, shall be cast, a majority electing.

Sec. 5. Associate members shall be elected from Officers of the Army, Revenue Cutter Service, foreign officers of the Naval and Military professions, and from persons in civil life who may be interested in the purposes of the Institute.

Sec. 6. Those entitled to become associate members may be elected life members, provided that the number not officially connected with the Navy and Marine Corps shall not at any time exceed one hundred (100).

Sec. 7. Associate members and life members, other than those entitled to regular membership, shall be elected as follows: "Nominations shall be made in writing to the Secretary and Treasurer, with the name of the member making them, and such nominations shall be submitted to the Board of Control, and, if their report be favorable, the Secretary and Treasurer shall make known the result at the next meeting of the Institute, and a vote shall then be taken, a majority of votes cast by members present electing."

Sec. 8. The annual dues for regular and associate members shall be two dollars, all of which shall be for a year's subscription to the UNITED STATES NAVAL INSTITUTE PROCEEDINGS, payable upon joining the Institute, and upon the first day of each succeeding January. The fee for life membership shall be thirty dollars, but if any regular or associate member has paid his dues for the year in which he wishes to be transferred to life membership, or has paid his dues for any future year or years, the amount so paid shall be deducted from the fee for life membership.

ARTICLE X

Sec. 2. One copy of the PROCEEDINGS, when published, shall be furnished to each regular and associate member (in return for dues paid), to each life member (in return for life membership fee paid), to honorary members, to each corresponding society of the Institute, and to such libraries and periodicals as may be determined upon by the Board of Control.

The PROCEEDINGS are published every two months, and anyone may subscribe for them. The annual subscription is $3.00; single copies, 50 cents. Annual dues for members and associate members, $2.00. Fee for life membership, $30.00.

All letters should be addressed U. S. Naval Institute, Annapolis, Md., and all checks, drafts, and money orders should be made payable to the same.

SPECIAL NOTICE

NAVAL INSTITUTE PRIZE ESSAY, 1917

A prize of two hundred dollars, with a gold medal, and a life-membership (unless the author is already a life member) in the Institute, is offered by the Naval Institute for the best essay presented on any subject pertaining to the naval profession.

On the opposite page are given suggested topics. Essays are not limited to these topics and no additional weight will be given an essay in awarding the prize because it is written on one of these suggested topics over one written on any subject pertaining to the naval profession.

The following rules will govern this competition:

1. The award for the prize will be made by the Board of Control, voting by ballot and without knowledge of the names of the competitors.

2. Each competitor to send his essay in a sealed envelope to the Secretary and Treasurer on or before January 1, 1917. The name of the writer shall not be given in this envelope, but instead thereof a motto. Accompanying the essay a separate sealed envelope will be sent to the Secretary and Treasurer, with the motto on the outside and writer's name and motto inside. This envelope is not to be opened until after the decision of the Board.

3. The successful essay to be published in the PROCEEDINGS of the Institute; and the essays of other competitors, receiving honorable mention, to be published also, at the discretion of the Board of Control; and no change shall be made in the text of any competitive essay, published in the PROCEEDINGS of the Institute, after it leaves the hands of the Board.

4. If, in the opinion of the Board of Control, the best essay presented is not of sufficient merit to be awarded the prize, it may receive "Honorable Mention" or such other distinction as the Board may decide.

5. In case one or more essays receive "Honorable Mention," the writers thereof will receive a minimum prize of seventy-five dollars and a life-membership (unless the author is already a life member) in the Institute, the actual amounts of the awards to be decided by the Board of Control in each case.

6. An essay not having received honorable mention may be published also, at the discretion of the Board of Control, but only with the consent of the author.

7. The essay is limited to fifty (50) printed pages in the PROCEEDINGS of the Institute.

8. It is requested that all essays be submitted typewritten and in duplicate, if practicable; essays submitted written in longhand and in single copy will, however, receive equal consideration.

9. In the event of the prize being awarded to the winner of a previous year, a gold clasp, suitably engraved, will be given in lieu of the gold medal.

By direction of the Board of Control.

B. C. ALLEN,
Lieut. Commander, U. S. N., Secretary and Treasurer

PRIZE ESSAY TOPICS

SUGGESTED AT THE INVITATION OF THE BOARD OF CONTROL

BY

THE PRESIDENT OF THE NAVAL INSTITUTE, THE SUPERINTENDENT OF THE NAVAL ACADEMY, THE PRESIDENT OF THE NAVAL WAR COLLEGE, AND THE COMMANDERS-IN-CHIEF OF THE ATLANTIC, PACIFIC AND ASIATIC FLEETS.

"The Mutual Relations of Gunnery and Tactics."

"The Place of the Naval Officer in International Affairs."

"The Evolution of Naval Doctrine from National Character."

"The Training of Enlisted Personnel to Produce Modern Man-o'-Warsmen: (a) Military Training; (b) Moral Training; (c) Education."

"The Organization, Employment and Training of Reserve Fleets and Flotillas."

"A Personnel Reserve for the Naval Service."

"Value of Speed as an Offensive Element in Battleship Strategy and Tactics, as Compared with Armor."

LIST OF PRIZE ESSAYS

1879

Naval Education. Prize Essay, 1879. By Lieut. Comdr. A. D. Brown, U. S. N.

NAVAL EDUCATION. First Honorable Mention. By Lieut. Comdr. C. F. Goodrich, U. S. N.

NAVAL EDUCATION. Second Honorable Mention. By Commander A. T. Mahan, U. S. N.

1880

"The Naval Policy of the United States." Prize Essay, 1880. By Lieutenant Charles Belknap, U. S. N.

1881

The Type of (I) Armored Vessel, (II) Cruiser best suited to the Present Needs of the United States. Prize Essay, 1881. By Lieutenant E. W. Very, U. S. N.

SECOND PRIZE ESSAY, 1881. By Lieutenant Seaton Schroeder, U. S. N.

1882

Our Merchant Marine: The Causes of its Decline and the Means to be taken for its Revival. "Nil clarius aquis." Prize Essay, 1882. By Lieutenant J. D. Kelley, U. S. N.

"MAIS IL FAUT CULTIVER NOTRE JARDIN." Honorable Mention. By Master C. G. Calkins, U. S. N.

"SPERO MELIORA." Honorable Mention. By Lieut. Comdr. F. E. Chadwick, U. S. N.

"CAUSA LATET: VIS EST NOTISSIMA." Honorable Mention. By Lieutenant R. Wainwright, U. S. N.

1883

How may the Sphere of Usefulness of Naval Officers be extended in Time of Peace with Advantage to the Country and the Naval Service? "Pour encourager les Autres." Prize Essay, 1883. By Lieutenant Carlos G. Calkins, U. S. N.

"SEMPER PARATUS." First Honorable Mention. By Commander N. H. Farquhar, U. S. N.

"CULIBET IN ARTE SUA CREDENDUM EST." Second Honorable Mention By Captain A. P. Cooke, U. S. N.

1884

The Reconstruction and Increase of the Navy. Prize Essay, 1884. By Ensign W. I. Chambers, U. S. N.

1885

Inducements for Retaining Trained Seamen in the Navy, and Best System of Rewards for Long and Faithful Service. Prize Essay, 1885. By Commander N. H. Farquhar, U. S. N.

1886

What Changes in Organization and Drill are Necessary to Sail and Fight Effectively Our Warships of Latest Type? "Scire quod nescias." Prize Essay, 1886. By Lieutenant Carlos G. Calkins, U. S. N.

THE RESULT OF ALL NAVAL ADMINISTRATION AND EFFORTS FINDS ITS EXPRESSION IN GOOD ORGANIZATION AND THOROUGH DRILL ON BOARD OF SUITABLE SHIPS. Honorable Mention. By Ensign W. L. Rodgers, U. S. N.

1887

The Naval Brigade: its Organization, Equipment and Tactics. "In hoc signo vinces." Prize Essay, 1887. By Lieutenant C. T. Hutchins.

1888

Torpedoes. Prize Essay, 1888. By Lieut. Comdr. W. W. Reisinger, U. S. N.

1891

The Enlistment, Training and Organization of Crews for our Ships of War. Prize Essay, 1891. By Ensign A. P. Niblack, U. S. N.

DISPOSITION AND EMPLOYMENT OF THE FLEET: SHIP AND SQUADRON DRILL. Honorable Mention, 1891. By Lieutenant R. C. Smith, U. S. N.

1892

Torpedo-boats: their Organization and Conduct. Prize Essay, 1892. By Wm. Laird Clowes.

1894

The U. S. S. Vesuvius, with Special Reference to her Pneumatic Battery. Prize Essay, 1894. By Lieut. Comdr. Seaton Schroeder, U. S. N.

NAVAL REFORM. Honorable Mention, 1894. By Passed Assistant Engineer F. M. Bennett, U. S. N.

1895

Tactical Problems in Naval Warfare. Prize Essay, 1895. By Lieut. Comdr. Richard Wainwright, U. S. N.

A SUMMARY OF THE SITUATION AND OUTLOOK IN EUROPE. An Introduction to the Study of Coming War. Honorable Mention, 1895. By Richmond Pearson Hobson, Assistant Naval Constructor, U. S. N.

SUGGESTIONS FOR INCREASING THE EFFICIENCY OF OUR NEW SHIPS. Honorable Mention, 1895. By Naval Constructor Wm. J. Baxter, U. S. N.

THE BATTLE OF THE YALU. Honorable Mention, 1895. By Ensign Frank Marble, U. S. N.

1896

The Tactics of Ships in the Line of Battle. Prize Essay, 1896. By Lieutenant A. P. Niblack, U. S. N.

THE ORGANIZATION, TRAINING AND DISCIPLINE OF THE NAVY PERSONNEL AS VIEWED FROM THE SHIP. Honorable Mention, 1896. By Lieutenant Wm. F. Fullam, U. S. N.

NAVAL APPRENTICES, INDUCEMENTS, ENLISTING AND TRAINING. The Seaman Branch of the Navy. Honorable Mention, 1896. By Ensign Ryland D. Tisdale, U. S. N.

THE COMPOSITION OF THE FLEET. Honorable Mention, 1896. By Lieutenant John M. Ellicott, U. S. N.

1897

Torpedo-boat Policy. Prize Essay, 1897. By Lieutenant R. C. Smith, U. S. N.

A PROPOSED UNIFORM COURSE OF INSTRUCTION FOR THE NAVAL MILITIA. Honorable Mention, 1897. By H. G. Dohrman, Associate Member, U. S. N. I.

TORPEDOES IN EXERCISE AND BATTLE. Honorable Mention, 1897. By Lieutenant J. M. Ellicott, U. S. N.

1898

Esprit de Corps: A Tract for the Times. Prize Essay, 1898. By Captain Caspar Frederick Goodrich, U. S. N.

OUR NAVAL POWER. Honorable Mention, 1898. By Lieut. Comdr. Richard Wainwright, U. S. N.

TARGET PRACTICE AND THE TRAINING OF GUN CAPTAINS. Honorable Mention, 1898. By Ensign R. H. Jackson, U. S. N.

1900

Torpedo Craft: Types and Employment. Prize Essay, 1900. By Lieutenant R. H. Jackson, U. S. N.

THE AUTOMOBILE TORPEDO AND ITS USES. Honorable Mention, 1900. By Lieutenant L. H. Chandler, U. S. N.

1901

Naval Administration and Organization. Prize Essay, 1901. By Lieutenant John Hood, U. S. N.

1903

Gunnery in Our Navy. The Causes of its Inferiority and Their Remedies. Prize Essay, 1903. By Professor Philip R. Alger, U. S. N.

A NAVAL TRAINING POLICY AND SYSTEM. Honorable Mention, 1903. By Lieutenant James H. Reid, U. S. N.

SYSTEMATIC TRAINING OF THE ENLISTED PERSONNEL OF THE NAVY. Honorable Mention, 1903. By Lieutenant C. L. Hussey, U. S. N.

OUR TORPEDO-BOAT FLOTILLA. The Training Needed to Insure its Efficiency. Honorable Mention, 1903. By Lieutenant E. L. Beach, U. S. N.

1904

The Fleet and Its Personnel. Prize Essay, 1904. By Lieutenant S. P. Fullinwider, U. S. N.

A PLEA FOR A HIGHER PHYSICAL, MORAL AND INTELLECTUAL STANDARD OF THE PERSONNEL FOR THE NAVY. Honorable Mention, 1904. By Medical Inspector Howard E. Ames, U. S. N.

1905

American Naval Policy. Prize Essay, 1905. By Commander Bradley A. Fiske, U. S. N.

THE DEPARTMENT OF THE NAVY. Honorable Mention, 1905. By Rear Admiral Stephen B. Luce, U. S. N.

1906

Promotion by Selection. Prize Essay, 1906. By Commander Hawley O. Rittenhouse, U. S. N.

THE ELEMENTS OF FLEET TACTICS. First Honorable Mention, 1906. By Lieut. Comdr. A. P. Niblack, U. S. N.

GLEANINGS FROM THE SEA OF JAPAN. Second Honorable Mention, 1906. By Captain Seaton Schroeder, U. S. N.

THE PURCHASE SYSTEM OF THE NAVY. Third Honorable Mention, 1906. By Pay Inspector J. A. Mudd, U. S. N.

1907

Storekeeping at the Navy Yards. Prize Essay, 1907. By Pay Inspector John A. Mudd, U. S. N.

BATTLE REHEARSALS. A few thoughts on our next step in Fleet-Gunnery. First Honorable Mention, 1907. By Lieut. Comdr. Yates Stirling, U. S. N.

THE NAVAL PROFESSION. Second Honorable Mention, 1907. By Commander Bradley A. Fiske, U. S. N.

1908

A Few Hints to the Study of Naval Tactics. Prize Essay, 1908. By Lieutenant W. S. Pye, U. S. N.

THE MONEY FOR THE NAVY. First Honorable Mention, 1908. By Pay Inspector John A. Mudd, U. S. N.

THE NATION'S DEFENCE—THE OFFENSIVE FLEET. How Shall We Prepare It for Battle? Second Honorable Mention, 1908. By Lieut. Commander Yates Stirling, U. S. N.

1909

Some Ideas about Organization on Board Ship. Prize Essay, 1909. By Lieutenant Ernest J. King, U. S. N.

THE NAVY AND COAST DEFENCE. Honorable Mention, 1909. By Commodore W. H. Beehler, U. S. N.

THE REORGANIZATION OF THE NAVAL ESTABLISHMENT. Honorable Mention, 1909. By Pay Inspector J. A. Mudd, U. S. N.

A PLEA FOR PHYSICAL TRAINING IN THE NAVY. Honorable Mention, 1909. By Commander A. P. Niblack, U. S. N.

1910

The Merchant Marine and the Navy. Prize Essay, 1910. By Naval Constructor T. G. Roberts, U. S. N.

THE NAVAL STRATEGY OF THE RUSSO-JAPANESE WAR. Honorable Mention, 1910. By Lieutenant Lyman A. Cotton, U. S. N.

1911

Navy Yard Economy. Prize Essay, 1911. By Paymaster Charles Conrad, U. S. N.

NAVAL POWER. Honorable Mention, 1911. By Captain Bradley A. Fiske, U. S. N.

WANTED—FIRST AID. Honorable Mention, 1911. By Commander C. C. Marsh, U. S. N.

1912

Naval Might. Prize Essay, 1912. By Lieutenant Ridgely Hunt, U. S. N. (retired).

INSPECTION DUTY AT THE NAVY YARDS. Honorable Mention, 1912. By Lieut. Commander T. D. Parker, U. S. N.

1913

The Greatest Need of the Atlantic Fleet. Prize Essay, 1913. By Lieut. Commander Harry E. Yarnell, U. S. N.

NAVY DEPARTMENT ORGANIZATION. A Study of Principles. First Honorable Mention, 1913. By Commander Yates Stirling, Jr., U. S. N.

TRAINED INITIATIVE AND UNITY OF ACTION. Second Honorable Mention, 1913. By Lieut. Commander Dudley W. Knox, U. S. N.

1914

The Great Lesson from Nelson for To-Day. Prize Essay, 1914. By Lieutenant Commander Dudley W. Knox, U. S. Navy.

NAVAL POLICY AS IT RELATES TO THE SHORE ESTABLISHMENT AND THE MAINTENANCE OF THE FLEET. Honorable Mention, 1914. By Captain John Hood, U. S. Navy.

OLD PRINCIPLES AND MODERN APPLICATIONS. Honorable Mention, 1914. By Lieutenant Commander Dudley W. Knox, U. S. Navy.

MILITARY PREPAREDNESS. Honorable Mention, 1914. By Naval Constructor Richard D. Gatewood, U. S. Navy.

1915

The Rôle of Doctrine in Naval Warfare. Prize Essay, 1915. By Lieutenant Commander Dudley W. Knox, U. S. Navy.

AN AIR FLEET: OUR PRESSING NAVAL WANT. First Honorable Mention, 1915. By Lieutenant Commander Thomas Drayton Parker, U. S. Navy.

TACTICS. Second Honorable Mention, 1915. By Ensign H. H. Frost, U. S. Navy.

DEFENSE AGAINST SURPRISE TORPEDO ATTACK. Third Honorable Mention, 1915. By Ensign R. T. Merrill, 2d, U. S. Navy.

1916

The Moral Factor in War. Prize Essay, 1916. By Lieutenant (J. G.) H. H. Frost, U. S. Navy.

NAVAL PERSONNEL. First Honorable Mention, 1916. By Lieutenant Commander J. K. Taussig, U. S. Navy.

EDUCATION AT THE U. S. NAVAL ACADEMY. Second Honorable Mention, 1916. By Lieutenant Ridgely Hunt, U. S. Navy.

SOME UNDERLYING PRINCIPLES OF MORALE. Third Honorable Mention, 1916. By Commander Dudley W. Knox, U. S. Navy.